CREOL, The College of Optics and Photonics

OSE 4470L Fiber Optic Communication Laboratory
CREOL, The College of Optics and Photonics
Credit Hours: 1
Term: Fall 2025

Syllabus

Mondays: I – 8:30AM – 11:20AM
II – 3:00PM – 5:50PM

Location: CREOL A210

Pre/Corequisites: OSE 4470 Fiber-Optic Communications

Instructor: Guifang Li

Contact: Webcourses@UCF
li@ucf.edu

TAs: Dhruv Desai, John Aziz, & Md Shariful Islam

Office Hours: Lab Weeks - Before/After class
Off-Weeks – Zoom Session / by appointment

Website: Webcourses@UCF

Additional Notes: Simple questions can be quickly answered via message on Webcourses. For more elaborate discussions, join Zoom sessions or schedule appointments.

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 learned 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
    a) keeping records in a lab notebook
    b) accurate data collection
    c) critical thinking

d) analysis of data
e) identifying sources of error

4. Write lab reports.

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.

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

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)
Graduates have an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	High
Graduates have an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	High
Graduates have an ability to communicate effectively with a range of audiences.	Low
Graduates have an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	Low

Graduates have an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.	High
Graduates have an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.	Low
Graduates have an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	Medium
Graduates have an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.	Low
Graduates have an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.	Medium
Graduates have an ability to communicate effectively with a range of audiences.	Low
Graduates have an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.	High

Course Grading and Requirements for Success

Attendance & Participation: 10%
Short Lab Reports: 48% (8% for each lab)
1 Full Lab Report: 14%
2 Quizzes: 12% (6% each)
Lab Notebook: 10%
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.
80 > C ≥ 70	Average, has a basic understanding of the major concepts of the course and is able to apply to basic situations.
70 > D ≥ 60	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.
60 > 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 Integrity
Students should familiarize themselves with UCF's Rules of Conduct at <https://scai.sdes.ucf.edu/student-rules-of-conduct/>. According to Section 1, "Academic Misconduct," students are prohibited from engaging in

1. Unauthorized assistance: Using or attempting to use unauthorized materials, information or study aids in any academic exercise unless specifically authorized by the instructor of record. The unauthorized possession of examination or course-related material also constitutes cheating.
2. Communication to another through written, visual, electronic, or oral means: The presentation of material which has not been studied or learned, but rather was obtained through someone else's efforts and used as part of an examination, course assignment, or project.
3. Commercial Use of Academic Material: Selling of course material to another person, student, and/or uploading course material to a third-party vendor without authorization or without the express written permission of the university and the instructor. Course materials include but are not limited to class notes, Instructor's PowerPoints, course syllabi, tests, quizzes, labs, instruction sheets, homework, study guides, handouts, etc.
4. Falsifying or misrepresenting the student's own academic work.
5. Plagiarism: Using or appropriating another's work without any indication of the source, thereby attempting to convey the impression that such work is the student's own.
6. Multiple Submissions: Submitting the same academic work for credit more than once without the express written permission of the instructor.
7. Helping another violate academic behavior standards.
8. Soliciting assistance with academic coursework and/or degree requirements.

Responses to Academic Dishonesty, Plagiarism, or Cheating
Students should familiarize themselves with the procedures for academic misconduct in UCF's student handbook, *The Golden Rule* <https://goldenrule.sdes.ucf.edu/>. UCF faculty members have a responsibility for students' education and the value of a UCF degree, and so seek to prevent unethical behavior and respond to academic misconduct when necessary. Penalties for violating rules, policies, and instructions within this course can range from a zero on the exercise to an "F" letter grade in the course. In addition, an Academic Misconduct report could be filed with the Office of Student Conduct, which could lead to disciplinary warning, disciplinary probation, or deferred suspension or separation from the University through suspension, dismissal, or expulsion with the addition of a "Z" designation on one's transcript.

Being found in violation of academic conduct standards could result in a student having to disclose such behavior on a graduate school application, being removed from a leadership position within a student organization, the recipient of scholarships, participation in University activities such as study abroad, internships, etc.

Let's avoid all of this by demonstrating values of honesty, trust, and integrity. No grade is worth compromising your integrity and moving your moral compass. Stay true to doing the right thing: take the zero, not a shortcut.

Unauthorized Use of Websites and Internet Resources

There are many websites claiming to offer study aids to students, but in using such websites, students could find themselves in violation of academic conduct guidelines. These websites include (but are not limited to) Quizlet, Course Hero, Chegg Study, and Clutch Prep. UCF does not endorse the use of these products in an unethical manner, which could lead to a violation of our University's Rules of Conduct.

They encourage students to upload course materials, such as test questions, individual assignments, and examples of graded material. Such materials are the intellectual property of instructors, the university, or publishers and may not be distributed without prior authorization. Students who engage in such activity could be found in violation of academic conduct standards and could face course and/or University penalties. Please let me know if you are uncertain about the use of a website so I can determine its legitimacy.

Unauthorized Distribution of Class Notes
Third parties may attempt to connect with you to sell your notes and other course information from this class. Distributing course materials to a third party without the my authorization is a violation of our University's Rules of Conduct. Please be aware that such class materials that may have already been given to such third parties may contain errors, which could affect your performance or grade.

Recommendations for success in this course include coming to class on a routine basis, visiting me during my office hours, connecting with the Teaching Assistant (TA), and making use of the Student Academic Resource Center (SARC), the University Writing Center (UWC), the Math Lab, etc. If a third party should contact you regarding such an offer, I would appreciate your bringing this to my attention. We all play a part in creating a course climate of integrity.

In-Class Recording
Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach enrolled students about a particular subject.

Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, private conversations between students in the class or between a student and the faculty member, and invited guest speakers is prohibited.

Recordings may not be used as a substitute for class participation and class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct as described in the Golden Rule.

Course Accessibility Statement
The University of Central Florida is committed to providing access and inclusion for all persons with disabilities. Students with disabilities who need access to course content due to course design limitations should contact the professor as soon as possible. Students should also connect with Student Accessibility Services (SAS) http://sas.sdes.ucf.edu/ (Ferrell Commons 185, sas@ucf.edu, phone 407-823-2371).

For students connected with SAS, a Course Accessibility Letter may be created and sent to professors, which informs faculty of potential course access and accommodations that might be

necessary and reasonable. Determining reasonable access and accommodations requires consideration of the course design, course learning objectives and the individual academic and course barriers experienced by the student. Further conversation with SAS, faculty and the student may be warranted to ensure an accessible course experience.

Deployed Active Duty Military Students
If you are a deployed active duty military student and feel that you may need a special accommodation due to that unique status, please contact your instructor to discuss your circumstances.

Campus Safety Statement
Emergencies on campus are rare, but if one should arise during class, everyone needs to work together. Students should be aware of their surroundings and familiar with some basic safety and security concepts.

- In case of an emergency, dial 911 for assistance.
- Every UCF classroom contains an emergency procedure guide posted on a wall near the door. Students should make a note of the guide's physical location and review the online version at https://centralflorida-prod.modolabs.net/student/safety/index.
- Students should know the evacuation routes from each of their classrooms and have a plan for finding safety in case of an emergency.
- If there is a medical emergency during class, students may need to access a first-aid kit or AED (Automated External Defibrillator). To learn where those are located, see https://ehs.ucf.edu/automated-external-defibrillator-aed-locations.
- To stay informed about emergency situations, students can sign up to receive UCF text alerts by going to https://my.ucf.edu and logging in. Click on "Student Self Service" located on the left side of the screen in the toolbar, scroll down to the blue "Personal Information" heading on the Student Center screen, click on "UCF Alert", fill out the information, including e-mail address, cell phone number, and cell phone provider, click "Apply" to save the changes, and then click "OK."
- Students with special needs related to emergency situations should speak with their instructors outside of class.

To learn about how to manage an active-shooter situation on campus or elsewhere, consider viewing this video https://youtu.be/NIKYajEx4pk.

UCF Cares
During your UCF career, you may experience challenges including struggles with academics, finances, or your personal well-being. UCF has a multitude of resources available to all students. Please visit UCFCares.com if you are seeking resources and support, or if you are worried about a friend or classmate. Free services and information are included for a variety of student concerns, including but not limited to alcohol use, bias incidents, mental health concerns, and financial challenges. You can also e-mail ucfcares@ucf.edu with questions or for additional assistance. You can reach a UCF Cares staff member between 8 a.m. and 5 p.m. by calling 407-823-5607. If you are in immediate distress, please call Counseling and Psychological Services to speak directly with a counselor 24/7 at 407-823-2811, or please call 911.

OSE-4470 Fiber Optic Communication Laboratory: Tentative Weekly Schedule			
Week	Date	Lab Topic	Note
1	Aug 18	Fiber Cleaving + Numerical Aperture of a Fiber	Lab
2	Aug 25	Lab 1 Report 1 Due, Zoom Office Hour	Report Due
3	Sep 1	Lab Day, No class.	
4	Sep 8	Coupling into Fiber + Profile of Fundamental Mode	Lab
5	Sep 15	Lab 2 Report Due, Zoom Office Hour	Report Due
6	Sep 22	High-Order Modes in Fiber,	Lab
7	Sep 29	Lab 3 Report Due, Zoom Office Hour	Report Due Quiz 1 (Labs 1 & 2)
8	Oct 6	Coupling and Propagation Loss	Lab
9	Oct 13	Lab 4 Report Due, Zoom Office Hour	Report Due
10	Oct 20	Analog Communication Link	Lab
11	Oct 27	Lab 5 Report Due, Zoom Office Hour	Report Due Quiz 2 (Labs 3 & 4)
12	Nov 3	Digital Communication Link	Lab
13	Nov 10	Writing Lab Report 6, Zoom Office Hour	Zoom Office Hour
14	Nov 17	Wavelength Division Multiplexing	Draft Lab 6 Long Report due
15	Week of Nov 24	Lab 7 Report Due, Lab Skills Test, Zoom Office Hour	Report Due
16	Week of Dec 1	FINAL EXAM Period, Lab Skills Test	Long Lab 6 Report Due December 1