
ECE 6930
Optical Fiber Communication Systems

Class Location/Time: Riggs 305/12:30-1:45pm TR

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Office hours: email to schedule

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Course Description

Prerequisites: ECE 3300, and ECE 3800, each with a C or better

This course introduces the topic of optical fiber communications, its key concepts, components and system architectures.

Course Objectives

The objective of this course is to introduce the students to the basics of optical fibers communications which form the backbone of our telecommunications infrastructure for providing services such as internet, telephone (wired or wireless), Cable TV and cellular networks. The course will cover basics of optical fibers, optical transmitters, optical receivers, modulation formats, basic transmission systems, optical amplifiers, wavelength-division-multiplexing, basic network architectures, and an introduction of recent developments in optical fiber communications.

Required Materials

Text book: Optical Fiber Communications 4th edition, Gerd Keiser, McGraw Hill

Topical Outline

1. Introduction: 6.25 hours
2. Optical fibers: 6.25 hours
3. Optical sources: 3.75 hours
4. Photodetectors: 1.25 hours
5. Receivers: 1.5 hours
6. Optical amplifiers: 4 hours
7. Digital links: 3.5 hours
8. Nonlinear effects: 2.5 hours

Grading

Quiz 1: 7.5%

Quiz 2: 15%

Quiz 3: 7.5%

Quiz 4: 7.5%

Quiz 5: 7.5%

Quiz 6: 7.5%

Quiz 7: 7.5%

Assignment 1: 5%

Assignment 2: 15%. This is a project. The students are required to write a Matlab code for finding eigenvalue solutions of optical waveguide equations and then transmission properties of lowest order optical modes.

Final exam: 20%

Total: 100%

A+	97-100	B+	87-89	C+	77-79	D+	67-69	F	0-59
A	93-96	B	83-86	C	73-76	D	63-66		
A-	90-92	B-	80-82	C-	70-72	D-	60-62		

Canvas

Canvas (<http://www.clemson.edu/canvas/>) is an electronic course management system that will be used to post videos, class notes, assignments, homework clarifications and hints, supplemental readings, links to other resources, and grades. Canvas will also be used to collect homework assignments and take exams.

Exams

If the university is closed due to unforeseen circumstances (e.g. inclement weather, power outage) during a scheduled exam time, then the exam will be rescheduled.

All exams are closed book and closed notes. You are permitted a hand-written single page (front and back, 8.5"x11") note sheet for interim tests and three pages for the final exam. The note sheet may NOT contain worked problems.

A missed & unexcused exam will be given a grade of zero.

If, for a good reason discussed and agreed upon by the instructor in advance, a student has an excused absence during a midterm, his/her final exam grade will be substituted in place of the missed test grade. NO makeup exams will be given. Students can be excused from at most two of the four midterms.

Homework and assignment

Homework and assignment problems will be assigned collected via Canvas as assignment for credit. Deadline is 11:59pm on the day which it is due, typically one week after assignment. Submit your homework in pdf file at BB/content under the assignment or hand in in class on the due date.

You should attempt every problem on your own. You are encouraged to discuss homework with your peers, but you should start and finish problems yourself. All submitted work must be completed by you individually. In case of copying other's homework, all involved will be given zero grade for the problem.

Write up your derivation and process as detailed as possible. Provide solutions to each assignment neatly, box the answers to all problems/subproblems, and write your name on each page. Penalties may be applied for straying from these guidelines. Derivation and process will be graded and grade will be deducted if no derivation and process is given.

To submit homework, scan the entire assignment into a SINGLE PDF file. (Other file formats will not be graded.) Problems should appear in the order they were assigned. Upload the pdf file to the submission location on Canvas under Assignments/ Homework #.

You will not be able to submit your homework assignment after the Homework Deadline.

Any postponement of the Homework Deadline due to unforeseen circumstances (IT outage, power outage) will be announced via email.

Attendance

Unless otherwise stated on the course specific syllabus, **students are expected to attend class, and to arrive on time.**

In the event of an **emergency**, students should contact the course instructor, preferably before class or the exam. Students should speak with instructors regarding any scheduled absence as soon as possible and develop a plan for any make-up work, if allowed by the instructor. It is the student's responsibility to secure documentation of emergencies, if required by the instructor. A student with an excessive number of absences may be withdrawn at the discretion of the course instructor.

If the instructor is late, students are expected to wait 15 minutes for the instructor to arrive.

Any further attendance policies in place will be listed on the course specific syllabus, and will serve to supplement these policies.

Inclement Weather Policy

Any exam that was scheduled at the time of a class cancellation due to inclement weather will be given at the next class meeting unless contacted by the instructor. Any assignments due at the time of a class cancellation due to inclement weather will be due at the next class meeting unless contacted by the instructor. Any extension or postponement of assignments or exams must be granted by the instructor via email or Canvas within 24 hours of the weather related cancellation.

Academic Integrity

As members of the Clemson University community, we have inherited Thomas Green Clemson's vision of this institution as a 'high seminary of learning.' Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form. In instances where academic standards may have been compromised, Clemson University has a responsibility to respond appropriately to charges of violations of academic integrity.

Further information on Academic Integrity can be found in the [Undergraduate Announcements](#) and in the [Graduate School Policy Handbook](#).

Access Accommodations

Clemson University values the diversity of our student body as a strength and a critical component of our dynamic community. Students with disabilities or temporary injuries/conditions may require accommodations due to barriers in the structure of facilities, course design, technology used for curricular purposes, or other campus resources. Students who experience a barrier to full access to this class should let the professor know, and make an appointment to meet with a staff member in Student Accessibility Services as soon as possible. You can make an appointment by calling 864-656-6848, by emailing studentaccess@lists.clemson.edu, or by visiting Suite 239 in the Academic Success Center building. Appointments are strongly encouraged – drop-ins will be seen if possible, but there could be a significant wait due to scheduled appointments. Students who receive Academic Access Letters are strongly encouraged to request, obtain and present these to their professors as early in the semester as possible so that accommodations can be made in a timely manner. It is the student's responsibility to follow this process each semester. You can access further information here:

<https://www.clemson.edu/academics/studentaccess/index.html>.

Anti-Harassment and Non-Discrimination

Clemson University is committed to a policy of equal opportunity for all persons and does not discriminate on the basis of race, color, religion, sex, sexual orientation, gender, pregnancy, national origin, age, disability, veteran's status, genetic information or protected activity in employment, educational programs and activities, admissions and financial aid. This includes a prohibition against sexual harassment and sexual violence as mandated by Title IX of the Education Amendments of 1972. This policy is located at <http://www.clemson.edu/campus-life/campus-services/access/title-ix/>. Ms. Alesia Smith is the Clemson University Title IX Coordinator, and the Executive Director of Equity Compliance. Her office is located at 110 Holtzendorff Hall, 864.656.3181 (voice) or 864.656.0899 (TDD).

Online Courses

In an online course, you will interact with the content, instructor, and/or classmates on at least a weekly basis through course assignments, asynchronous discussions and/or synchronous sessions as indicated on the course specific syllabus. Further resources for online courses may be found here:

<http://www.clemson.edu/online/students/>.

Computing technology questions may be sent to ITHELP@clemson.edu.

Emergency Procedures

Emergency procedures have been posted in all buildings and on all elevators. Students should review these procedures for their own safety. Students are required to monitor their university email (see <https://www.clemson.edu/studentaffairs/student-handbook/universitypolicies/email->

[communications.html](#)) thus establishing this as a convenient method for official communication to students. Students are also encouraged to enroll in CU-Safe alerts. See <https://www.clemson.edu/cusafety> for more information.

Copyright Statement

Materials in some of the courses are copyrighted. They are intended for use only by students registered and enrolled in a particular course and only for instructional activities associated with and for the duration of the course. They may not be retained in another medium or disseminated further. They are provided in compliance with the provisions of the Teach Act. Students should be reminded to refer to the Use of Copyrighted Materials and “Fair Use Guidelines” policy in on the Clemson University website for additional information: <https://www.clemson.edu/library/>.