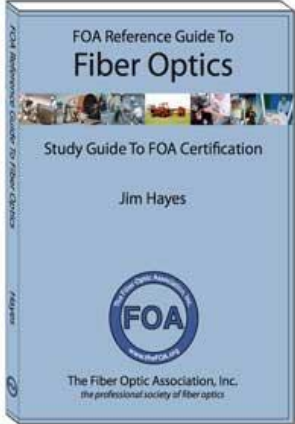


University of Texas at El Paso
Electrical and Computer Engineering
Fiber Optic Communications – Summer 2022
EE4361-32191 / EE5336-32192

INSTRUCTOR:	Virgilio Gonzalez
OFFICE:	Eng Annex 333
PHONE:	915 747 6622
EMAIL:	vgonzalez3@utep.edu Please include in the subject line “EE4361: “ ; or “EE5336: “
OFFICE HOURS:	MW 2:00 – 3:00 PM, after class. Or by appointment via MS Teams
TEXT: (Also recommended references)	<ul style="list-style-type: none"> • Jim Hayes, “FOA Reference Guide to Fiber Optics and Study Guide to FOA Certification”, The fiber Optic Association, 2018. • Basic Fiber Optics Program from Fiber Optic Association: <div style="text-align: right;">  </div> <p style="text-align: center;">https://fiberu.org/basic/index.html</p> <ul style="list-style-type: none"> • Gerd Keiser, “<i>Optical Fiber Communications</i>”, 4th Edition, McGraw Hill (Reference), • George C. Papen, “<i>Lightwave Communications</i>”, Cambridge University Press, 2019 (Reference), • Le Nguyen Binh, “<i>Optical Fiber Communications Systems</i>”, CRC Press, (Reference) • Rajiv Ramaswami, “<i>Optical Networks</i>”, 3rd Edition, Morgan Kaufmann, (Reference) • Supplemental materials in Blackboard
Catalog Description	Light propagation using ray and electromagnetic mode theories, dielectric slab waveguides, optical fibers attenuation and dispersion in optical fibers, optical fiber transmitters and receivers, electro-optical devices, and optical fiber measurement techniques
Prerequisites/ Co-requisites	EE3338, EE3321
Delivery mode	The class will be delivered in a hybrid mode. The in-person session will be simultaneously streamed via Zoom. The

	sessions will be recorded and made available later, but it might take few days to appear. Some sessions will be online only. Look for announcements in Blackboard.
--	--

Course Outcomes

1. Understand light propagation using ray and electromagnetic mode theories
2. Calculate the effects of attenuation and dispersion in optical fibers
3. Understand the operation and calculate the performance of optical fiber transmitters, receivers, and optical devices.
4. Apply optical fiber measurement techniques to the design of optical links
5. Analyze and design Optical communication networks

Content Material

Session#	Date	Topic
1	06/12/23	Introduction to Optical Networks
2	06/13/23	Network functions, Layer Model
3	06/14/23	Power analysis in optical links
4	06/15/23	Channel capacity
5	06/16/23	Ray analysis of light propagation in optical fibers
6	06/19/23	Juneteenth Holiday, no class
7	06/20/23	Dispersion in multimode fibers
8	06/21/23	Wave analysis of optical fibers, Dispersion in single mode fibers
9	06/22/23	Waveguides, couplers and splitters
10	06/23/23	Optical transmission sources (Lasers, LEDs)
11	06/26/23	Optical amplifiers
12	06/27/23	Photodetectors (PIN and APD)
13	06/28/23	Optical Receivers
14	06/29/23	Coherent Modulation and Demodulation
15	06/30/23	Wavelength Division Multiplexing
16	07/03/23	Complex Optical Networks
17	07/04/23	NO CLASS
18	07/05/23	Student Presentations (Current topics Optical Comms)
19	07/06/23	Student Presentations (Current topics Optical Comms)
20	07/07/23	Closing session, Exam #4 instructions

- The class will be delivered in a hybrid mode. The in-person session will be simultaneously streamed via Zoom. The sessions will be recorded and made available later, but it might take few days to appear. Some sessions will be online only. Look for announcements in Blackboard.

- Each session consists on learning modules available through BlackBoard. They are composed of brief notes, videos and assigned readings.
- You are expected to dedicate about 2 to 3 hours per session to review the assigned materials, answer problems, submit postings and assignments.
- Students are highly encouraged to participate in the allocated lecture to interact with the instructor. This will be done through Blackboard Collaborate in an open discussion room to clarify questions or have further explanations about the course subjects. Recordings will be made and be available for later review.
- For the final sessions, the students will need to form teams and will be assigned a current topic in the telecommunications industry. The team will need to make a slide presentation / video presentation (guidelines available in Blackboard) and upload to instructor to share with class.
- Technology Requirements
 - Course content is delivered via the Internet through the **Blackboard** learning management system (LMS). Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Mozilla Firefox and Google Chrome are the most supported browsers for Blackboard; other browsers may cause complications with the LMS. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.
 - You will need to have or have access to a computer/laptop, scanner, a webcam, and a microphone. You will need to download or update the following software: Microsoft Office, PDF reader tool (Adobe or others), Media players (Flashplayer, Windows Media Player or QuickTime), and Java. Check that your computer hardware and software are up-to-date and able to access all parts of the course.
 - If you encounter technical difficulties beyond your scope of troubleshooting, please contact the Help Desk as they are trained specifically in assisting with technological needs of students.

GRADING

ITEM	Points / Total
Exams 1, 2, 3 & 4	150 ea / 600 total
Homework (total divided proportionally ~5 or 6)	120 total
Class responses to Hw posts	60 total
Reports or special assignments	60 total
Student Group Presentations	160
TOTAL	1000

- Each element will accumulate points, Some elements are individual and others depend on team performance (presentations)
- Exams will be conducted through Blackboard and require solving problems or applying concepts.
- **Show always all the procedure** to arrive to the solutions. End results without the right procedure are considered conceptual errors. Procedures for exams will be uploaded separately.

- After the initial grading is done, to earn partial credit, students might need to identify the cause of the errors and provide with an additional correction document stating the proper procedure to obtain a valid answer. (maximum 50 % credit only)
- **Homework:** Students will need to propose a solution to an open-ended problem and posting the concise proposal in the Blackboard discussion boards within 24 hours of finishing the corresponding content session. Expected length is between one or two paragraphs per problem and attach needed graphics.
 - Afterwards, students are required to inspect at least two proposals from other students and make comments about the solutions. Responses must be posted no later than 48 hrs after the assignment become active. The length of the comments should be about one single paragraph.
- Letter scale will be **A:** 90%-100%; **B:** 80%-89.9%; **C:** 70%-79.9%; **D:** 60%-69.9%; **F:** below 60% of the reference grade.
- Team assignment require forming a team consisting of **3 UG students (or 2 UG and 1 Gr, or 2GR)**.
- All members must contribute for each assignment and shall be able to demonstrate it, along with the understanding of their peer's portions.
- **Graduate students** are expected to make a higher quality job than undergraduates.
- **Each report must have a typed cover page.**
- Reports will be turned in to the professor or the TA before each deadline through the assignment area in **Blackboard**.
- Some large attachments might require saving the document in a shared OneDrive folder and share the link with the instructor.
- Additional requirements may be stated in specific assignments.

GENERAL COURSE POLICIES

- Samples of student work will be collected for accreditation purposes. Please notify the professor, in writing, if there is any confidentiality restriction.
- **No late work** will be accepted and special accommodations require the letters with instructions from CASS.
- The Professor will be available only during the assigned office hours or by appointment.
- For email questions or concerns, please start the email subject line with “ **EE4361: ...** “ .
- Each piece of written work must include **EE4361 or EE5336, name, student ID, TEAM** number (when applicable) at the **upper right corner** of the first page; and the **name** in all remaining pages.
- All printed work must have good presentation. Final results must be emphasized (example red underline or highlighted box)
- Online work must have in the first text line the name of the student and the team number when applicable.
- Detailed instructions for the **assignments** will be **provided later** in separate handouts through **Blackboard**

Academic Honesty, Accommodations and NETiquette

- It is expected that the students will conduct with integrity in all course areas. Do not attempt to engage in a dishonest activity such as copying, plagiarism, falsifying information, etc. The professor will take measures to prevent such instances and will bring a case to the university authorities.
- Information about University wide policies could be found in the Dean of Students Web page at <http://studentaffairs.utep.edu/Default.aspx?alias=studentaffairs.utep.edu/dos>
- NETiquette
 - Always consider audience. Remember that members of the class and the instructor will be reading any postings.
 - Respect and courtesy must be provided to classmates and to instructor at all times. No harassment or inappropriate postings will be tolerated.
 - When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a F2F situation.
 - Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space. If students wish to do so, they have the ethical obligation to first request the permission of the writer(s).
- The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University. Students requesting an accommodation based on a disability must register with the UTEP Center for Accommodations and Support Services.

STUDENT RESOURCES

UTEP provides a variety of student services and support:

- [UTEP Library](#): Access a wide range of resources including online, full-text access to thousands of journals and eBooks plus reference service and librarian assistance for enrolled students.
- [Help Desk](#): Students experiencing technological challenges (email, Blackboard, software, etc.) can submit a ticket to the UTEP Helpdesk for assistance. Contact the Helpdesk via phone, email, chat, website, or in person if on campus.
- [University Writing Center \(UWC\)](#): Submit papers here for assistance with writing style and formatting, ask a tutor for help and explore other writing resources.
- [Math Tutoring Center \(MaRCS\)](#): Ask a tutor for help and explore other available math resources.
- [History Tutoring Center \(HTC\)](#): Receive assistance with writing history papers, get help from a tutor and explore other history resources.
- [Military Student Success Center](#): UTEP welcomes military-affiliated students to its degree programs, and the Military Student Success Center and its dedicated staff (many

of whom are veterans and students themselves) are here to help personnel in any branch of service to reach their educational goals.

- [RefWorks](#): A bibliographic citation tool; check out the RefWorks tutorial and Fact Sheet and Quick-Start Guide.