

EEC135 – Optoelectronics for High-Speed Data Networking and Computing Systems Spring Quarter 2023

Course Description: Principles of optical communication systems. Planar dielectric waveguides. Optical fibers: single-mode, multi-mode, step and graded index. Attenuation and dispersion in optical fibers. Optical sources (LEDs and lasers) and receivers. Design of digital optical transmission systems.

Prerequisites: EEC 130B, Introductory Electromagnetics II

Lecture/discussion schedule:

Wednesday, Friday 11:30-1:20 pm. Kerr 293

Instructor: Prof. Weijian Yang (weiyang@ucdavis)

Office hours:

Weijian Yang: TBD @ Kemper 3127, or by appointment

Textbook:

G. Keiser, Optical Fiber Communications, McGraw-Hill, fourth edition or fifth edition.

Canvas: Most of the information for this course will be provided on canvas, including course announcements, homework assignments, etc. This information will be updated frequently during the quarter.

Homework: Assigned most weeks on Friday, due by 10:00pm the following Friday. Late submission will receive 20% score reduction per day. All the homework will be submitted online through Canvas. Homework copied from others will be considered cheating. All students involved with copying will receive a no-appeal grade F for the course.

In-lecture quiz: There will be quizzes during most of the Friday lectures. The quizzes are typically short and aim to keep everyone on track of course progress. Closed book. No notes allowed. Calculators will be allowed, but will not be critical. Quizzes will be graded by peer students and reviewed by the instructor.

Exam:

Midterm exam: Wednesday, May 10, 11:30-1:20 pm

Final exam: Monday, June 12, 1-3 pm

Requests for make-up quiz and exam will only be approved in cases that strong written justification can be provided. The instructor must be contacted, in advance, about missing a quiz or exam and requests for make-ups.

Re-grading: If you think you deserve more credit for submitted work, write a short note indicating what should be reconsidered and return it to the instructor within one week after the graded material is returned.

Grading: letter grade based on the following

- Homework: 30%
- Quiz: 20%
- Midterm: 20%
- Final: 30%

Academic Integrity: Cheating and plagiarism will not be tolerated. Professional integrity is an important aspect of all engineering and science disciplines.

Acknowledge the Code of Academic Conduct: All students are required to acknowledge the [Code of Academic Conduct](#) for each registered course, no later than the quarter add deadline. my.ucdavis.edu will notify students online and through email for the action.

Please read the code of Academic Conduct at <http://sja.ucdavis.edu/files/cac.pdf>

Please also visit <https://participate.ucdavis.edu/>

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Student resources: The following webpage contains many useful resources.

<https://ebeler.faculty.ucdavis.edu/resources/faq-student-resources/>

Course flow:

Week 1 - Introduction and recap of relevant optical concepts (Keiser - Chapter 1)

Week 2 - Waveguides and optical fibers (Keiser - Chapter 2)

Week 3 - Signal degradation in optical fibers (Keiser - Chapter 3)

Week 4 - Light sources (Keiser - Chapter 4)

Week 5 - Power launching and coupling (Keiser - Chapter 5)

Week 6 - Photodetectors (Keiser - Chapter 6)

Week 7 - Optical receivers (Keiser - Chapter 7)

Week 8 - Optical fiber links (Keiser - Chapter 8)

Week 9 - Wavelength division multiplexing (Keiser - Chapter 10)

Week 10 - Optical amplifiers (Keiser - Chapter 11)