

OPTI 330: Physical Optics II

Effective Spring 2024

Course Description:

This course will cover linear system theory, Fourier optics, image formation, interference, and optical transfer functions.

Pre-requisites:

OPTI 210: Physical Optics

Number of Units/ component:

3 units / lecture

Locations and Times:

Mondays & Wednesdays 1:00-2:15pm, Meinel 422.

Instructor Information:

Instructor name: Euan McLeod

Office: Meinel 623

Email: ewanmc@optics.arizona.edu

Office hours:

Before January 25: Wednesdays, 2:15-3pm, in Meinel 422

After January 25: Wednesdays 11am-noon, in Meinel 623

TA: Kenneth Lang

Email: klang2000@arizona.edu

Office hours:

Mondays, 11am-noon, Meinel 654.

Thursdays, 9:30-10:30am, Meinel 554.

Expected Learning Outcomes:

1. Learn linear system theory.
2. Learn the Fourier transform and its properties.
3. Understand discrete representation of continuous signals.
4. Learn to manipulate discrete signals on a computer.
5. Understand diffraction and image formation using physical optics principles.
6. Understand the principles of Fourier optics.
7. Become proficient in analyzing optical systems using linear system theory.

Recommended Texts:

- Course notes will be provided for all the lectures, free of charge via the class D2L website

- J. Goodman, *Fourier Optics*, Roberts & Company (2005).
- J. S. Tyo and A. Alenin, "Field Guide to Linear Systems in Optics," SPIE Press, ISBN: 9781628415. <https://www.spiedigitallibrary-org.ezproxy2.library.arizona.edu/ebooks/FG/Field-Guide-to-Linear-Systems-in-Optics/eISBN-9781628415483/10.1117/3.1002932?SSO=1#> =
- J.D. Gaskill, "Linear Systems, Fourier Transform, and Optics," John Wiley and Sons, 1978.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent. Providing student email addresses to a third party is not permitted. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA email to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of electronic resources provided by The University of Arizona. This conduct may also constitute copyright infringement.

Homework Policy:

There will be homework assigned approximately every week. The homework will be due on Friday mornings at 8 am, to be submitted via the D2L website. If the homework is late by up to one week, then a 20% reduction in score will be applied. **No assignments will be accepted more than one week late.** Any extensions or exceptions to this policy need to be arranged with the instructor **before** the due date.

Number of Exams and Papers:

There will be two 75-minute, in-class midterm exams. There will be one final exam, scheduled according to the university final exam scheduling guidelines. One letter-size page of notes (front and back) will be allowed for use in the exams.

Exam Schedule:

Assignment	Date
Midterm #1	2/7/24
Midterm #2	3/27/24
Final Exam	5/6/24 1pm-3pm

Final Grades:

Homework	30%
Midterm #1	15%
Midterm #2	25%
Final Exam	30%
Total	100%

The grading scale is A: 90-100%, B:80-89%, C: 70-79%, D: 60-69%, E: <60%. The thresholds between grades may be lowered by the instructor depending upon the final distributions of grades, but will not be raised.

Academic Integrity

Integrity and ethical behavior are expected of every student in all academic work. This Academic Integrity principle stands for honesty in all class work, and ethical conduct in all labs and clinical assignments. This principle is furthered by the student Code of conduct and disciplinary procedures established by ABOR Policies 5-308 through 5-404, all provisions of which apply to all University of Arizona students. The Code of Academic Integrity is intended to fulfill the requirement imposed by ABOR Policy 5-403.A.4 and otherwise to supplement the Student Code of Conduct as permitted by ABOR Policy 5-308.C.1.

For more details please see:

<https://deanofstudents.arizona.edu/policies/code-academic-integrity>

You are expected and encouraged to consult with your colleagues in the preparation of your homework assignments. Homework assignments are for the benefit of the student, so if you do not understand the homework, you are the only one that will suffer. However, please do not insult your colleagues, the grader, or me by turning in directly copied homework. If you work with a colleague closely enough that your solutions might appear (legitimately) to be copied, then please disclose the collaboration on the top of the page. It is quite acceptable to consult references, other course notes, other faculty, senior graduate students, etc., in preparing your solutions. However, any consultation with an outside source that contributes significantly to the solution you turn in should be disclosed.

Examinations are to be your own work and exclusively your own work.

Misconduct of any kind will be prosecuted and may result in any or all of the following:

- Reduction of grade
- Failing grade
- Referral to the Dean of Students for consideration of additional penalty, i.e. notation on a student's transcript re. academic integrity violation, etc.

Lecture recordings

Lecture recordings, which may be used for makeup lectures, are posted at the discretion of the instructor. Students must access content in D2L only. Students may not modify content or re-use content for any purpose other than personal educational reasons. All recordings are subject to government and university regulations. Therefore, students accessing unauthorized recordings or using them in a manner inconsistent with UArizona values and educational policies are subject to suspension or civil action.

Attendance Policy

It is important to attend all classes, as what is discussed in class is pertinent to adequate performance on assignments and exams. If you must be absent, it is your responsibility to obtain and review the information you missed.

"All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion. Absences pre-approved by the UA Dean of Students (or Dean's designee) will be honored."

Classroom Behavior

The Arizona Board of Regents' Student Code of Conduct, ABOR Policy 5-308, prohibits threats of physical harm to any member of the University community, including to one's self. See: <http://policy.web.arizona.edu/threatening-behavior-students>.

Accessibility and Accommodations

At the University of Arizona, we strive to make learning experiences as accessible as possible. If you anticipate or experience barriers based on disability or pregnancy, please contact the Disability Resource Center (520-621-3268, <https://drc.arizona.edu>) to establish reasonable accommodations.

The information contained in this syllabus, other than the grade and absence policies, may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.