

**The University of Iowa
The College of Liberal Arts and Sciences
Spring 2023**

Title of Course: Introduction to Optics (PHYS:4720)}

Course meeting time and place: 70 Van Allen, Tu Th 12:30 pm to 1:45 pm

Department of Physics: <https://physics.uiowa.edu/>

Course ICON site: To access the course site, log into [Iowa Courses Online \(ICON\)](https://icon.uiowa.edu/index.shtml) <https://icon.uiowa.edu/index.shtml> using your Hawk ID and password.

Course Home

For Undergraduate Courses: The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the add and drop deadlines, the “second-grade only” option (SGO), academic misconduct policies, and other undergraduate policies and procedures. Other UI colleges may have different policies.

For Graduate Courses: The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the policies and procedures for its courses. Graduate students, however, must adhere to the [academic deadlines set by the Graduate College](#).

Instructor

Office location:

Physical: 138 Iowa Advanced Technology Center (<https://maps.uiowa.edu/iatl>)
(319) 335-3347

Virtual: Zoom 364-590-3192

Student drop-in hours: Mon 2-5 pm or by appointment

Phone: 319-335-3347

E-mail: john-prineas@uiowa.edu

DEO: Professor Hallsie Reno, available for appointment via Misty Lyon, 203 Van Allen, 335-3238

Description of Course

This course will examine of the basics of waves, how light interacts with matter, and how light reflects, refracts, scatters, and propagates through material media (dielectrics, metals, optically active and birefringent material), optical components (lenses, objectives, beamsplitters, prisms, waveplates), systems and physical structures. We will also look at multi-beam interference in thin films and interferometers, and near and far field diffraction. Finally, we will examine Fourier optics, the basics of coherence theory, and introduce lasers and nonlinear optics.

Learning Objectives

- Learn important physics principles and concepts in optics
 - I will update this list just prior to each chapter in class
- Learn to apply principles learned to solving problems
 - Homework
 - Exams

Textbook/Materials

The required textbook for this course is: Hecht, Optics, 5th Ed.

Academic Honesty and Misconduct

All students in CLAS courses are expected to abide by the [CLAS Code of Academic Honesty](#). Undergraduate academic misconduct must be reported by instructors to CLAS according to [these procedures](#). Graduate academic misconduct must be reported to the Graduate College according to Section F of the [Graduate College Manual](#).

Student Complaints

Students with a complaint about a grade or a related matter should first discuss the situation with the instructor and/or the course supervisor (if applicable), and finally with the Director or Chair of the school, department, or program offering the course.

Undergraduate students should contact [CLAS Undergraduate Programs](#) for support when the matter is not resolved at the previous level. Graduate students should contact the CLAS [Associate Dean for Graduate Education and Outreach and Engagement](#) when additional support is needed.

Drop Deadline for this Course

You may drop an individual course before the deadline; after this deadline you will need collegiate approval. You can look up the [drop deadline for this course](#) here. When you drop a course, a “W” will appear on your transcript. The mark of “W” is a neutral mark that does not affect your GPA. Directions for adding or dropping a course and other registration changes can be found on the [Registrar’s website](#). Undergraduate students can find policies on dropping and withdrawing [here](#). Graduate students should adhere to the [academic deadlines](#) and policies set by the Graduate College.

Grading System and the Use of +/-

Pluses and minuses will be used in the grading for this course

Final grades will be awarded based on the following ranges:

A	B	C	D	F
A+ 92-100	B+ 71-77	C+ 50-56	D+ 29-35	F < 15
A 85-91	B 64-70	C 43-49	D 22-28	
A- 78-84	B- 57-63	C- 36-42	D- 15-21	

Course Grades

Final course grades will be assessed based on your performance in the following activities: Exam 1: 25% Exam 2: 25% Final: 25% Homework: 25%. You can check your scores on exams on the course webpage via ICON.

Homework:

Exams: The two in-class exams will cover material from approximately half of the course, including information presented in lecture and readings; the final exam will be comprehensive. The exams will test student's knowledge in applying course concepts to solve problems. You will get practice solving problems through weekly homework problems. We will review course material a week before the exam. Suggested study techniques for the exam are to review course material, review homework problems, and do additional practice problems.

Date and Time of the Final Exam

The final examination date and time will be announced by the Registrar generally by the fifth week of classes and it will be announced on the course ICON site once it is known. **Do not plan your end of the semester travel plans until the final exam schedule is made public. It is your responsibility to know the date, time, and place of the final exam.** According to Registrar's final exam policy, students **have a maximum of two weeks after the announced final exam schedule** to request a change if an exam conflict exists or if a student has more than two exams in one day (see the [policy](#) here).

Course Calendar of Assignments and Exams

- Homeworks will be assigned each Th, and will be due the following Th. These will be problems from the course textbook.
- There will be two in-class exams and a final. The first in-class exam is scheduled for Tue Feb 28; the second for Tu Apr 25.
- There are reading assignments for each class. Refer to the below schedule.

Date-Week of	Reading Assignments
Jan 16	Tu,Th: Review Chpts 2-3
Jan 23	Tu: Chapt 4 The Propagation of Light 4.1-4.5 Th: 4.6-4.11
Jan 30	Tu: Chapt 5 Geometrical Optics 5.1-5.4 Th 5.5-5.9
Feb 6	Tu: Chapt 6 More Geometrical Optics. 6.1-6.5 Th: Chapt 7 The Superposition of Waves 7.1-7.2
Feb 13	Tu: 7.3-7.4 Th: Chapt 8 Polarization 8.1-4

Feb 20	Tu: Review Th: 8.5-8.8
Feb 27	Tu: Midterm Exam Th: 8.9-8.13
Mar 6	Tu: Chapt 9 Interference 9.1-9.2 Th: 9.3-5
Mar 13	Spring Break
Mar 20	Tu: 9.6-9 Th: Chapt 10 Diffraction 10.1-3
Mar 27	Tu: 10.3-4 Th: Chapt 11 Fourier Optics 11.1-2
Apr 3	Tu: 11.3 Th: Chapt 12 Basics of Coherence Theory 12.1-3
Apr 10	Tu: 12.4-5 Th: Chapt 13 Modern Optics 13.1-2
Apr 17	Tu: Review Th 13.2-3
Apr 24	Tu: Midterm Exam II Th 13.3-4
May 1	Tu: Catchup and review Th: Review

College of Liberal Arts and Sciences (CLAS) Course Policies

Attendance and Absences

You are expected to attend all classes.

Homework

- Homework turned in late will be marked down
- Your worst homework score will be dropped
- Your homework is expected to be your work only. You are encouraged to work on it with classmates, but the final writeup should be your own. You should not try to obtain or copy online solutions, which is a breach of academic honesty, will hurt your performance on exams, and impede learning objectives.
- Start your homework early, and if you have problems, I encourage you to visit me during my office hours.

Exam Policies

- University regulations require that students be allowed to make up examinations which have been missed due to illness or other unavoidable circumstances. Students with mandatory religious obligations or UI authorized activities must discuss their absences with me as soon as possible. Religious obligations must be communicated within the first three weeks of classes.

Communication: UI Email

Students are responsible for all official correspondences sent to their UI email address (uiowa.edu) and must use this address for any communication with instructors or staff in the UI community.

Where to Get Help

If you need help with homework problems or understanding course material, I encourage you to stop by my office. I also encourage you to work with your classmates.

University Policies

[Accommodations for Students with Disabilities](#)

[Basic Needs and Support for Students](#)

[Classroom Expectations](#)

[Exam Make-up Owing to Absence](#)

[Free Speech and Expression](#)

[Mental Health](#)

[Military Service Obligations](#)

[Non-discrimination](#)

[Religious Holy Days](#)

[Sexual Harassment/Misconduct and Supportive Measures](#)

[Sharing of Class Recordings](#)