

Introduction to Optics

TuTh 1:00-2:15 pm (plus two hours of laboratory time per week to be scheduled)

Lecture: 109 Lewis Hall

Lab: Lewis 203. This semester we will also use a second location in Lewis Hall which is to be determined.

Prof. Joel Mobley

My office is at the Jamie Whitten National Center for Physical Acoustics (NCPA), Room 1034 – ph:915-6937. It is about a 7 minute walk from Lewis Hall.

jmobley@olemiss.edu (E-mail is the best way to communicate with me.)

Office Hours: Thursday 3-5p, 1034 NCPA

Other times by appointment at NCPA or Lewis Hall: I am glad to meet with you outside of class so do not hesitate to make an appointment outside regular office hours.

If you want to come to see me at NCPA, you must contact me beforehand because the building is locked. I will need to let you in.

Final Exam is Thursday, April 29 at 12 pm. The final is comprehensive.

Grading

Homework/Class participation	15 %
Laboratory	25 % NOTE: you must earn at least 60% of these points to pass the course.
Midterm Exams (2)	20 %
Final Exam	20 %

Grading Scale (Minimum Score for Letter Grade)

A: 92	B+: 83	C+: 70	D: 50
A-: 87	B: 79	C: 66	
	B-: 74	C-: 60	F:<50

Textbook – *Optics*, 5th Ed., by Eugene Hecht (ISBN-13: 978-0133977226)

Course Description – Intermediate description of electromagnetic wave propagation, and the physics of waves; topics in general wave phenomena, and geometrical & physical optics, including interference diffraction, polarization, and quantum optics; lab exercises in physical and geometrical optics.

Learning Objectives

At the completion of this course, the student should be able to describe optical and general wave phenomena in terms of the ray, wave and particle models and make appropriate use of these to solve problems. They should also be able to quantitatively link diffraction, interference, reflection and transmission phenomena to the physical properties of waves, and the interaction of light with matter and materials.

Rules

- Attendance is expected if you are able. If you are unable to attend in-person for any legitimate reason, I will make every effort to accommodate you.
- Class participation is required. You are expected to give thoughtful responses even if you don't know the answer. The intent is to help you think through issues, and a respectful attitude toward your fellow students is expected.
- Instructors are required to enter attendance verifications for each of their courses by the end of the second week of regular Fall/Spring semester. If you will be absent during the initial two weeks, you must inform me beforehand to remain enrolled.
- The lab requires two hours of in-person attendance per week. If you are unable to attend in-person for any reason, I will make every effort to accommodate you.
- Lab reports that are more than two weeks overdue will not be accepted. Late reports will be penalized.
- A homework rubric will be provided. You must adhere to the format. Work that does not follow the rules will be returned without being graded.

Topics Covered

- Properties of waves
- Electromagnetic waves
- Ray optics
 - Propagation in materials, at boundaries
 - Image formation
 - Lens systems
- Physical optics and wave phenomena
 - Polarization
 - Diffraction
 - Interference
 - Coherence
- Modern Optics
 - Quantum Physics
 - Lasers
- Selected topics (fiber optic waveguides, etc...)

Laboratory

The laboratory part of the course requires two hours a week. The students will be broken into two groups, and each student will attend one of two sessions each week. The precise times of the labs will be scheduled during the first week of classes. These are typically held on Monday, Wednesday and/or Thursday afternoons from 5 to 7 pm. Each student will choose which session they will attend over the semester. Laboratories will meet each week after the second week of class. The labs will be held in two sessions in order to accommodate everyone's schedules and facilitate health protocols. Note that some take-home labs may be given. Materials will be provided in those cases.

University of Mississippi Access and Inclusion

The University of Mississippi is committed to the creation of inclusive learning environments for all students. If there are aspects of the instruction or design of this course that result in barriers to your full inclusion and participation or to accurate assessment of your achievement, please contact the course instructor as soon as possible. Barriers may include, but are not necessarily limited to, timed exams and in-class assignments, difficulty with the acquisition of lecture content, inaccessible web content or the use of non-captioned or non-transcribed video and audio files. Students must also contact Student Disability Services at 662-915-7128 so that office can 1) provide you with an Instructor Notification form, 2) facilitate the removal of barriers and 3) ensure you have equal access to the same opportunities for success that are available to all students.

Academic Integrity

Every student of the University of Mississippi, by virtue of choosing to be part of the university community agrees to abide by the University of Mississippi Creed and the UM Academic Integrity Policy which covers academic integrity. Cheating on any assignment is forbidden and, in this course, will result in a zero grade on the given assignment. If a second case of cheating occurs, this will result in an F for the entire course. Please consult the M-Book, Academic Integrity document for details on university policy and the academic creed.

UM Creed

The University of Mississippi is a community of learning dedicated to nurturing excellence in intellectual inquiry and personal character in an open and diverse environment. As a voluntary member of this community:

- I believe in respect for the dignity of each person
- I believe in fairness and civility
- I believe in personal and professional integrity
- I believe in academic honesty
- I believe in academic freedom
- I believe in good stewardship of our resources
- I pledge to uphold these values and encourage others to follow my example

Class Materials Policy

All materials distributed electronically and in hard copy in this class are protected under intellectual copyright. Any attempt to upload these documents onto the Internet (or to distribute them by some other means) or to profit from the distribution (by Internet or other means) of these documents constitutes theft and will be in violation of intellectual property law and the UM Academic Conduct Code unless expressly permitted for by the instructor. Accessing such materials for your own use is also in violation of the UM Academic Conduct Code. Additionally, the distribution of your own class notes via the Internet or other means, or access of such materials, encourages absence from class and is highly discouraged except for occasional loaning of notes to students concurrently enrolled in the class.

Audio and video recording

Audio and/or video recording of class lectures is not allowed unless explicit permission is given by the instructor. Permission will only be given if the student has a Student Disability Services request. In such cases, recordings may only be used by the student to whom permission is given and all recordings must be deleted at the end of the semester. Recordings may not be distributed online or elsewhere.