

Physics 343 - Physics of Lasers and Modern Optics

Lecture:

3:30-4:50 p.m. Monday OR TBD – Jorgensen Hall 245, (section 150) Prof. Peter Dowben

Laboratories:

2 to 5 p.m. Tuesday, Wednesday, OR FRiday Jorgensen Hall 233, Arjun Subedi

This is a calculus-based course intended for engineering students or science majors (physics, chemistry, biology). Prerequisites: Phys 211 and Phys 212. The laboratory course is intended to cover basic optics, lasers diode lasers and diffraction.

The University strives to make all learning experiences as accessible as possible. If you anticipate or experience barriers based on your disability (including mental health, chronic or temporary medical conditions), please contact Services for Students with Disabilities (SSD), 117 Louise Pound Hall, for a confidential discussion of your individual needs for academic accommodation. It is the policy of the University of Nebraska-Lincoln to provide flexible and individualized accommodation to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office <<http://www.unl.edu/ssd/>>, 1117 Louise Pound Hall, (402) 472-3730 voice or TTY. If you are eligible for services and register with their office, make arrangements with Services for Students with Disabilities (SSD) office so individualized accommodation can be implemented in a timely manner.

Academic Resources

There are a number of resources available on campus to help you master the course content. A few of them are described below.

First, please take note of my office hours listed below. You are always welcome to stop by and ask questions of me or Mr. Subedi, regarding course content. If you are not available during my office hours, let me know and we can arrange for an appointment outside of the regularly scheduled office hours. We are happy to do this.

Second, the Physics Resource Center, located on the second floor of Jorgensen Hall, provides free tutoring to physics students. Information regarding the Resource Center, including its hours of operation and tutor schedule, can be found [here](#). No appointments are needed to get assistance at the Resource Center, just show up and start asking questions! Lastly, the Center for Academic Success and Transition's Study Stop program offers free tutoring. Both walk-ins and appointments are accepted. Please note that these tutors are not vetted by the Physics Department. More information can be found [here](#).

Instructor:

Prof. Dowben's office is on the third floor of Jorgensen Hall, room 310L. His office hours will be every Tuesday and Thursday, 1:30-2:30 p.m. Other meeting times can be arranged by appointment (the phone number is 472-9838; e-mail: pdowben1@unl.edu). *Please avoid contacting the instructor prior to lectures. Please remember: you are not the only students*

*expecting help, there are other classes and other students, and every student needing help deserves help. But if you need help, **please** make an effort to get help. Asking for help by e mail or phone is NOT asking for help, unless it is to set up an appointment. Physics and engineering problems are NOT best addressed by phone nor e mail. One-on-one or in class (or after class) will serve you better.*

Textbook:

There is no required text for this course, apart from the laboratory manual, but the textbook "Optics", by Hecht (Publisher: Pearson; ISBN-13 - 978-1292096933) is something that a lot of students find useful. As a side note, a much earlier version of this textbook was my textbook as a first year engineering student at Anglia - Ruskin University and I still have the book on my shelf, so yes it continues to be useful. If you want to have a success route to studying, it is recommended that you buy the hard copy not the e Textbook. Amazon has used copies as well as new.

Lectures:

The lecture periods will attempt to prelude to the laboratories. In addition, the lecture period will be used to give weekly updates, and special instructions. **No** audio or visual recordings (including camera cell phone recordings) may be made in or of the class without permission: the lecture material is the sole property of the University of Nebraska.

Expected Courtesies

No audio or visual recordings (including camera cell phone recordings) may be made in or of the class or laboratory without permission: be mindful of your lab partner's wishes. Arriving late is RUDE. Again: be mindful of your lab partner's wishes. **Cell phones will be turned off** or, better yet, not brought at all to lecture or laboratory. Be persistent if you cannot find help immediately.

Questions about laboratories are difficult to answer over the phone, so please come to Dowben's office, even if it isn't office hours (or see Arjun Subedi).

Grades cannot be given out over the phone under any circumstances. Persistent requests for grade information during grading (at the end of semester, in particular) will only serve to slow the grading process.

Laboratories:

To do well in this course, plan on coming to the laboratories well prepared beforehand. This may mean spending **as much as** 12 hours, including class time, per week on this course. Buy 2 laboratory notebooks, so that you can use one while the other is being graded.

Schedule:

Week(s)	Experiment	Title	Assignment	Due
Jan. 22-26	1	Laser Safety	schedule and survey	
Jan 29- Feb 2	1	Laser Safety	quiz 1	in lab
Feb 5-9; Feb 12-16	2	Optical Detector Physics		
Feb 19-23; Feb Mar 1	3	Fundamentals of Laser Operation	quiz 2	in lab
Mar 4 - 8	4	Geometrical Optics		
Mar 11-15		spring break		
Mar 18-22	4	Geometrical Optics		

Mar 25-29; April 1-5	5	Polarization		
April 8-12; April 15-19	6	Semiconductor Diode Lasers		
April 22-26; April 29-May	7	Diffraction and Fourier Optics		
May 6-10		No lecture or Laboratory, oral reports scheduled	Formal report	May 10

Make-ups:

There are **no** make-ups for missed lectures or laboratories.

Grading:

Final grades will NOT be posted. You can access your grades through the web, visit Prof. Dowben after exam week, or leave an addressed envelope with Prof. Dowben with your name and identification number (the envelope does NOT have to be stamped, only addressed clearly). The grade you receive in the course will be based on

- Two Quizzes (10%)
 - In Lab, for Experiments 1 & 3
- Laboratory Notebooks (60%)
 - Turn in the week after completing the experiment
- One Formal Reports (15%)
 - For Expt. 3 and for an Experiment TBD
 - Due March 8th and May 10th
- Oral Report (15%)
 - Covering your Formal Report
 - Given the week of May 6