

PHYSICS 333(EE 347)--Modern Optics

- INSTRUCTOR:** John Keto
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office hours: MWF 1:30 pm
- GRADER:** Ahmed Helal ahmedhelal238@yahoo.com
- CLASS:** MWF 11-12
Phy 333 Unique #56880; EE 347 Unique #16210
Meets BUR 220
- TEXT:** *Introduction to Optics*, F. L. Pedrotti and L. S. Pedrotti 3rd Ed.
If available, 2nd Ed.
Possible optics reference books:
Optics by Hecht. This was the text in 2009,2010. It is easy to read and quite descriptive, but many thought that it was too wordy.
Optics by Klein and Furtek, This text was last used 2006 and is more complete mathematically than Pedrotti.
Fundamentals of Optics by Jenkins and White, a classic, older text.
Introduction to Classical and Modern Optics by Jurgen R. Mey-Arendt
Principles of Optics by Born and Wolf, this is considered the bible of optics. It is often used as the text in graduate courses.
- EXAMS:** 3 "hour" exams and 1 Final. The hour exams will be normalized to 100 pts. Each exam will be announced at least one week in advance and probable dates are listed on the syllabus. The final will count 200 pts. The lowest hour exam grade will be dropped. If you miss an exam for any reason that exam will be dropped; there will be no make-up exams. The final examination is comprehensive and will take place at the date and time indicated in the exam schedule of the *Course Schedule*.
- Grade breakdown
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| Homework (assigned each week) | 20% |
| Hourly Quizzes (15% each) | 30% |
| Final exam | 30% |
| Project | 20% |
- HOMEWORK:** Homework will be assigned each week, usually at a rate of a couple of problems each lecture. These problems will be due at the

beginning of class each Monday. Do not procrastinate and try to complete all of the problems Sunday. Work throughout the week. By having the problems due weekly you will have the benefit of scheduling your own time (rather than being required to turn work after each lecture. If I discover that you are not managing your time correctly I may revert to collecting the work each lecture.

DO THE HOMEWORK. You will get little out of the course if you do not. Homework from the week before will be collected on Mondays. There is no credit for late homework.

DROP DATES: The last date to drop the course (with dean's approval) except for urgent and substantiated non-academic reasons is **April 6, 2005.** If you become seriously ill or have other personal problems I encourage you to appeal for withdrawal for non-academic reasons. Do not let such circumstances generate a poor grade on your transcript.

DISABILITIES: Please notify me of any modification/adaptation you may require to accommodate a disability-related need. You will be requested to provide documentation to the Dean of Students' Office, in order that the most appropriate accommodations can be determined. Specialized services are available on campus through Services for Students with Disabilities.

SCHOLASTIC DISHONEST: Will not be tolerated. What is permissible:
Homework--conferring with others is allowed but what you submit must be your own work (not copied).
Projects: what you submit must be the team's own work, programs, results, and text, and it must be referenced properly. If it's not referenced, and it's not yours (even short paragraphs), then it is plagiarism. I do encourage consulting all sources that you can so long as they are acknowledged. In addition, I intend to evaluate your project in terms of what you add above and beyond the referenced sources.
Exams: Note sheets (1 page) and programmable calculators are allowed for the exams. Any exchange of information is not allowed. Prior knowledge of exam questions is also not allowed.

Date	Subject	Chapt. Ed 2	Chapt. Ed. 3
Jan. 21	Introduction: Chapter 1	Chapt. 1	Chapt. 1
Jan. 23	Ch 1 Prod and Measurement	Ch 2	Ch. 1.2-1.4
Jan. 26	Ch 3 Geometric Optics	Sec 3.0-3.3	Ch. 2.0-2.3
Jan. 28	Ch 3 Refraction, mirrors	Sec 3.5-3.8	Ch. 2.5-2.7
Jan. 30	Ch 3 Spherical surfaces, thin lens	Sec 3.8-3.11	Ch 2.8-2.11
Feb. 2, 4	Ch 4 Paraxial Rays and Matrices	Ch 4 all	Ch 18 all
Feb. 6, 9	Ch 6 Instruments, Stops	Ch 6 all	Ch 3 all
Feb. 11, 13	Ch 5 Aberrations	Ch 5	Ch 20 all
Feb. 16	First Quiz		
Feb 18	Ch 8 Wave equations	Sect 8.1-8.4	Ch 4.1-4.4
Feb. 20	Waves and Maxwell's Eqn	Sect. 8.5-8.7	Ch 4.5-4.7
Feb. 23	Ch 9 Superposition	Ch 9 all	Ch 5
Feb. 25	Review: Chapter 10 and Ch 11.1-11.3 ed 2, Ch 7 and Ch 8.1-8.3 ed. 3 should be known from Freshman Physics—Review these sections, as we will use this material, but have only a brief review		
Feb. 27, Mar. 2	Ch 11 Multiple beam interference	Sec 11.4-11.9	Ch 8.4-8.9
Mar. 4	Ch 17 Gratings	Sec 17.1-17.4	Ch 12.1-12.4
Mar. 6, 9	Fresnel Eqns	Sect. 20.1-20.4	Ch. 23.1-23.4
Mar. 11,13	Multilayer Films-matrices	Ch 19 all	Ch. 22 all
Mar 16-20 spring break			
Mar. 23	Ch. 14 Polarization, Jones Matrices	Ch 14 all	Ch 14
Mar. 25	Quizz 2 through Fresnel Eqns.		
Mar. 27	Ch 15 Polarized Light	Sec 15.1-15.3	Sec 15.1-15.3
Mar. 30	Birefringence, Double Refract	Sect 15.4-15.6	Sect 15.4-15.6
Apr. 1	Ch 16 Fraunhoffer Diffraction	Ch 16 all	Ch 11 all
Mar. 3, Apr. 6, 8	Ch 18 Fresnel Diffraction	Ch 18 all	Ch 13 all
Apr. 10	Ch 12 Coherence	Ch 12 all, exc 12.4	Ch 9 all, exc 9.4
Apr. 13, 15	Ch 21 Lasers	Ch 21 all	Ch. 6
Apr. 17, 20	Ch 22 Laser beams	Ch 22 all	Ch. 27 all
Apr. 23	Fiber Optics	Ch 24 all	Ch. 10 all
Apr. 24, 27	Fourier Optics	Ch 25 all	Ch. 21
April 29	Quizz 3 Through laser beams		
May 1, 4, 6	Nonlinear Optics	Ch 26	Ch. 24
May 8	Last class—questions, Projects due.		