

10020PHYS334000

Optics II

Lecture Hours: 11:10 – 12:00, Tuesdays, 10:10 – 12:00, Thursdays

Location: Room Phys 313

Instructor: Prof. Ci-Ling Pan (潘犀靈教授)

Room 231, Physics Building

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Office Hours: by appointment

Teaching Assistant: to be assigned.

Course Objective:

- Optics II is a continuation of Optics I and intended to provide broad, intermediate-level coverage of the field of optics, establishing a solid foundation for further work or study. This material is important for many disciplines. We begin with interference and diffraction. This is followed by Fourier Optics and Imaging, Coherence and Holography, lasers, crystal and nonlinear optics.
- A student who have successfully completed this course is expected to have a solid foundation in optics so that
 - He can pursue optics and photonics as a career.
 - Use optics as a tool for advanced studies in science and engineering or tackling industrial problems.

Text Book and Reading Materials:

There are no required textbooks. Course slides will be made available. Several important references have been put on reserve, available in the Physics Library, 3rd floor, the Physics Building. You are strongly urged to study the reading materials. Most of the materials are covered in:

1. Eugene Hecht, *Optics*, 4th Ed., Addison Wesley, 2002.
2. A. Lipson, S.G. Lipson, and H. Lipson, **Optical Physics**, Cambridge University Press, 4th Ed., 2011.

Other optics books you might be interested in consulting:

- Bahaa E. A. Saleh, Malvin Carl Teich, **Fundamentals of Photonics**, 2nd Ed., Wiley-Interscience, 2007. (First edition of the book is available as an E-book from the library).
- Frank L. Pedrotti, Leno M. Pedrotti, Leno S. Pedrotti, **Introduction to Optics**, 3rd Ed., Pearson Prentice Hall, 2007.
- Grant R. Fowles, **Introduction to Modern Optics**, Holt, Rinehart and Winston, 1968.
- Francis A. Jenkins, Harvey E. White, **Fundamentals of Optics**, McGraw-Hill, 1981.
- Karl Dieter Moller, **Optics**, University Science Books, 1988.
- Miles V. Klein, **Optics**, Wiley, 1986.
- Max Born, Emil Wolf, **Principles of optics**: electromagnetic theory of propagation, interference and diffraction of light, Pergamon Press, 1980

We use heavily slides adapted from those of Prof. Trebino's course website (Georgia Tech): <http://phweb.physics.gatech.edu/frog/lectures/index.html>

Pre-requisites:

Optics I or equivalent course.

Grading

Grades will be determined by problem sets, midterm exams and a final examination. The formula that will be used to calculate your final grade is as follows:

Problem Sets: 30%

Midterms I & II: 40%

Final Exam: 30%