

## Physics 4510 -- Optics

This course is designed to give the student a solid foundation in modern optical physics. It is also intended to provide the student with a familiarity with the most common optical devices and their application. Topics covered include geometrical optics, the refraction of light, lenses, the wave theory of light, Maxwell's equations applied to classical optics, coherence, reflection, diffraction and wave propagation in bulk media. We will also discuss interferometers, resonators, optical spectroscopy and light scattering. In the latter portion of the course and if time permits we will cover some of the most up-to-date research topics including lasers, optical particle traps, second-harmonic generation and particularly quantum optics.

### Instructor:

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### Grader

Mr. Weichung Fong  
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### Text:

*Optics*, E. Hecht, Forth edition, Addison Wesley, Pub.

### References:

*The Feynman Lectures on Physics*, Freeman Press, 3 volumes.  
*Principles of Optics*, by Born and Wolf, Pergamon Press.  
*Seeing the Light*, by Falk, Brill and Stork, Harper and Row Press  
*Fundamentals of Optics*, by Jenkins and White  
*Introduction to Fourier Optics*, by J. Goodman

### Homework & Reading Assignments:

Read material to be covered in lecture before the lecture.  
Problem assignments are generally given on Thursday and are due the following Thursday  
No late assignments will be accepted (but see item below).  
Lowest homework score will be dropped from grade computation.

### Grading Policy:

Homework	20%
Midterm exam	30%
Final exam	30%
Class interaction	<u>20%</u>
<b>Total</b>	<b>100.0%</b>

Grades will be determined on a roughly Gaussian basis.

**Midterm exam date: TBA**

**Final exam time: Saturday December 12, 1:30 PM – 4:00 PM**