

PHYS 609 Modern Optics

PHYS 609 Modern Optics Fall 2017

- Instructor:** Dr. Anthony M. Johnson
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<http://physics.umbc.edu/people/faculty/johnson/>
- Class:** Mondays and Wednesdays
1:00PM – 2:15PM
Information Technology 456
- Office Hours:** Mondays and Wednesdays
2:45PM – 3:30PM, TRC 029
Or Through Email
- Text:** Eugene Hecht: Optics (4th Edition)
Lecture Notes and Slides: e.g., Rick Trebino (Georgia Institute of Technology) and others
- Reference:** Robert Guenther, Modern Optics (1st or 2nd Edition)
- Prerequisites:** Basic electromagnetic theory, basic theory of ordinary differential equations, vector analysis
- There will be an in-class mid-term and final exam. There will be no exam make-up except for University-policy accepted absence.
 - Each student will be required to give a 15-minute oral presentation on a topic in Modern Optics. Please select your topic by Friday, October 20th at the latest. Classmates will also judge the presentation based on clearness, content, and classmates understanding of the topic.
 - Each student will write a term paper on a topic in Modern Optics. The topic could be the same as the oral presentation and could be related to the student's research. A good term paper should stand alone and include all the necessary components, which typically includes a literature review, theory/experimental outline, applications and summary.
- Grading:**
- | | |
|--------------------------|-----|
| Homework: | 20% |
| Presentation/Discussion: | 10% |
| Term Paper: | 10% |
| Mid-term Exam: | 30% |
| Final Exam: | 30% |
- Course Topics:** Maxwell's Equations and EM Wave Theory
EM Spectrum

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Absorption and the Refractive Index

The Propagation of Light

Fresnel's Equations of Reflection and Refraction

Fourier Series and the Fourier Transform

Polarization

Geometrical Optics

Interference and Diffraction

Coherence

Lasers and Nonlinear Optics

Ultrafast Optics Research Lab Tour and Demonstration of Modern Optics

Principles