

## PHYSICS 396 - Optical Properties of Solids

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**TEXT:           Optical Properties of Solids, 2<sup>nd</sup> edition, by Mark Fox**

The course will focus on material in the first 9 chapters of Fox's book along with background physics in Appendices A, B, and D.

### **Lectures and student-teacher interactions:**

Lectures will be given in person Mon., Wed., Fri., 1:35 pm – 2:25, Lewis Lab room 511. Expect 1 homework assignment per week.

Course materials will be made available on coursesite.

Student questions outside of class will be handled by in-person meetings after class or at my office. For individual meetings, please make an appointment with me by e-mail. I am available for office meetings M-Th, 10:30am-4:30pm.

**My preferred mode of communication is e-mail.**

### **Accommodations for Students with Disabilities**

Lehigh University is committed to maintaining an equitable and inclusive community and welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact Disability Support Services (DSS), provide documentation, and participate in an interactive review process. If the documentation supports a request for reasonable accommodations, DSS will provide students with a Letter of Accommodations. Students who are approved for accommodations at Lehigh should share this letter and discuss their accommodations and learning needs with instructors as early in the semester as possible. For more information or to request services, please contact Disability Support Services in person in Williams Hall, Suite 301, via phone at 610-758-4152, via email at [indss@lehigh.edu](mailto:indss@lehigh.edu), or online at <https://studentaffairs.lehigh.edu/disabilities>.

### **The Principles of Our Equitable Community:**

Lehigh University endorses The Principles of Our Equitable Community [[http://www.lehigh.edu/~inprv/initiatives/PrinciplesEquity\\_Sheet\\_v2\\_032212.pdf](http://www.lehigh.edu/~inprv/initiatives/PrinciplesEquity_Sheet_v2_032212.pdf)]. We expect each member of this class to acknowledge and practice these Principles. Respect for each other and for differing viewpoints is a vital component of the learning environment inside and outside the classroom.

**Initial competences:**

Introductory electricity and magnetism and quantum mechanics. A background in solid-state physics is NOT assumed for this course. Topics in solid-state physics, such as energy bands, effective mass, and density of states, will be introduced in lectures for this course, as needed, as the course proceeds.

**Final competences:**

Classical theory of light propagation in solids

Introductory quantum mechanics of optical transitions

Interband absorption

Excitons

Luminescence from solids

Free electrons

Molecular materials

Luminescent centers

Additional topics such as photonic devices, quantum confinement, and phonons will be covered if time permits.