

# Syllabus: Solid State Physics I

Fall 2014

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Office Hours: TBD

## Course Description:

This is an introduction to solid state physics. No previous knowledge of solid state physics will be assumed, but a familiarity with quantum mechanics is required.

## Topics covered:

- lattice structure:  
crystals, symmetry groups, X-ray diffraction
- thermodynamics and transport:  
Drude theory, Sommerfeld theory, Boltzmann equation
- band theory:  
Bloch states, tight binding models
- interactions:  
second quantization, Hartree-Fock approximation, phonons, screening

## Textbook:

For the first 2/3's of the course, we will follow the textbook of Neil W. Ashcroft and N. David Mermin, **Solid State Physics**. The last 1/3 of the course, covering interactions in the more modern second quantization framework, is not covered in this text.

## Grading:

Homework: 30%  
Midterm 1: 20%  
Midterm 2: 20%  
Final: 30%