

Solid State Chemistry (Chem 754)

Time : MWF 9:30-10:18 am (McPherson 1008)
Instructor : Dr. Patrick Woodward
Office : 3109 Newman Wolfram Lab
Phone : 688-8274
E-mail : woodward@chemistry.ohio-state.edu
Home page : http://www.chemistry.ohio-state.edu/~woodward/chem_754.htm
Office Hrs : Anytime really, but official office hours will be
Monday-Friday 1 - 2 pm

TA: Meghan Knapp
Office : 4120 Newman Wolfram Lab
Phone : 292-3991
E-mail : mknapp@chemistry.ohio-state.edu

Grading : 15% Daily Questions
25% Homework
30% Midterm
30% Final Examination

Syllabus

- Introduction
- Structures of Extended Inorganic Solids
- Symmetry and its application to Extended Solids (Crystallography)
- Diffraction and Characterization Techniques
- Ionic and Covalent Bonding
- Band Theory from the Chemists Perspective
- Properties and Applications of Extended Inorganic Materials
 - Color
 - Electronic Conductivity
 - Magnetism
 - Dielectrics
 - Ionic Conductors
 - Superconductivity

Reference Texts

"Solid State Chemistry: An Introduction" 2nd Edition
Lesley Smart and Elaine Moore (1998)
Stanley Thornes Publishers

This is a good text, written at a level that is fairly easy to understand for people new to the field. It doesn't cover all of the topics that we will cover in this class, nor does it go into the same level of detail that we will, but it is a well written and good supplement to the class.

"Basic Solid State Chemistry" 2nd Edition
Anthony R. West (1999)
John Wiley and Sons

This is a more comprehensive text in some ways than the Smart and Moore book. It is a bit dated, because it is essentially a shortened version of a larger book published in the late 1980's. This book is probably the most popular book for teaching this class, and I used it for the first two years I taught.

"New Directions in Solid State Chemistry" 2nd Edition
C.N.R. Rao and J. Gopalakrishnan (1997)
Cambridge University Press

More modern and detailed than the first two texts. Covers many of the topics that we will discuss, plus many others. The style of the book is more of a reference work for practicing solid state chemists, than as a text book.

"The Physics and Chemistry of Materials"
Joel I. Gersten and Frederick W. Smith (2001)
John Wiley and Sons

Among the books on this list this is the most comprehensive treatment of properties. Written more from the point of view of a physicist, it would be a good reference, but the style and approach is different from mine.
