Introduction to Materials Science (PHY 480/580)

Instructor: Prof. Bogdan Dabrowski, Physics Department, NIU. You can find me in my office (La Tourette Hall 216; phone: 753-6474) or in my labs La Tourette Hall 215 and FR 110 (phone: 753-6472) on Mondays, Tuesdays, Wednesdays and Fridays. You can also reach me on Thursdays at Argonne National Laboratory (phone: 630-252-5541) or at email dabrowski@anl.gov.

Course meeting time and place: 2:00 to 3:15 PM on Tuesdays and Thursdays in Davis Hall 116.

Office hours: on Tuesdays and Thursdays from 1:00 to 2:00 PM at La Tourette Hall 216.


Chapters and topics we will study:
1) Introduction to Materials (1 class)
2) Atomic Structure (2 classes)
3) Atomic and ionic Arrangement (3 classes)
4) Imperfections in the Atomic Arrangement (2 classes)
5) Atomic and Ionic Movements in Materials (3 classes)
6) and 7) Mechanical Properties and Behavior (Parts, 1 class)
10) Solid Solutions and Phase Equilibrium (Parts, 2 classes)
Midterm Exam:
15) Ceramic Materials (2 classes)
19) Electrical Behavior of Materials (3 classes)
20) Magnetic Behavior of Materials (3 classes)
22) Thermal and Thermoelectric Properties of Materials (3 classes)
21) Photonic Materials (2 classes)
Review (1)
Final Exam:

There will be several problems solved in class for every chapter we study. Additional problems will be assigned as homework every week. I will collect and grade these problems the following week – there is no substitute for solving problems on your own. There will be closed-books midterm and final exams.

The grades will be based on the total amount of points you would accumulate during the course (homework 30%, mid-term exam 30%, and final exam 40%):

A: 85 – 100%
B: 70 – 84%
C: 55 – 69%
D: 45 – 54%

I hope you will enjoy the course!