Course Credit: 4 quarter hours

Course Description:
This course is intended for chemistry, physics, and geology majors, and is designed to prepare students for further study in inorganic chemistry or, more generally, employment in physical or materials sciences fields.

The course content will include advanced concepts in structure, bonding, and chemical/physical properties of inorganic compounds, understanding of which is central to the study of all areas of chemistry. Major topics will include:

1) Structure, bonding and properties of inorganic solids (solid state chemistry, including descriptive crystal chemistry and X-ray crystallography), and
2) Structure, bonding and properties of molecular inorganic compounds (including molecular orbital theory, symmetry, group theory, and vibrational/electronic spectroscopy.

Chem 412/512 (Advanced Inorganic Chemistry II) further examines features of molecular inorganic compounds (particularly, coordination compounds), organometallic compounds, and bioinorganic compounds; Chem 411/511 will provide the appropriate background for these topics.

Prerequisites: General Chemistry (221-223) is required; General Physics (203 or 213), Calculus (251-253), and Physical Chemistry (440-442) is recommended.

Instructor: Andrea M. Goforth, Ph.D.
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Lecture: Mondays, Wednesdays, and Fridays, 10:15 - 11:20 am, FAB 40-07
Office Hours: Wednesdays and Fridays, 12:00 pm - 1:00 pm, others available by appointment

Important Class Dates:
Symmetry Scavenger Hunt: Monday, October 19, 10:15 am – 11:20 am
Mid-term Exam Date: Wednesday, October 24, 10:15 am – 11:20 am
Final Exam Date and Time: Wednesday, December 5, 10:15 am – 12:05 pm

Suggested Texts (Graduate): Anthony R. West, *Solid State Chemistry*.

I will teach primarily from the required text, with occasional use of the suggested text, as well as other texts, literature works, internet videos, etc. Any prior edition of Miessler & Tarr’s *Inorganic Chemistry* is similar in content and layout to the 4th ed. However, I will assign homework from the 4th ed., so make sure that you work the correct homework set.

Course Outline: See separate handout, “Tentative Schedule”

Grading: A: 90-100%, B: 80-89%, C: 70-79%, D: 60-69%, F: <60%
The letter grade will be determined using the following formula: number of accumulated points / total possible points x 100%. I will use the +/- system within the broad letter-grading scheme listed above. The distribution of these points by assignment is listed below.

Examinations (1 mid-term exam, Wednesday, October 24, 10:15 am – 11:20 am): 100 points
Final Exam (1 final exam, Wednesday, December 5, 10:15 am – 12:05 pm): 150 points
Homework Sets: 100 points (14 assignments, grad; 10 assignments, undergrad)
Lab Activities (participation in one, in-class “lab” activity (20 points), and completion of the accompanying project (30 points); participation in one, out-of-class “lab” activity (20 points) and accompanying project (30 points)): 100 points
Solid State Chemistry “Presentation” (due, Friday, November 30): 50 points
Solid State Chemistry “Indexing Lab” (due date, TBA): 50 points

Key: Grad = green; Undergrad = blue; Grad and Undergrad = red
For both the Mid-Term Exam and the Final Exam, graduate and undergraduate students will have different tests, with different levels of difficulty.

Homework & Late Work Policy:
Late homework will drop 10% in point value for each day it is late; it may be turned in in class on the due date, or by 5 pm on the due date to the Chemistry Office (STRC 262). A legitimate, verifiable reason for missing a test must be supplied in order for a student to be allowed to make up a missed exam or other in class activity. If you have a legitimate reason, and you know in advance that you will miss a test, please see me as soon as possible to make arrangements for an alternate testing time.

Disability statement: Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss your specific needs. Please contact the PSU Disability Resource Center, located in Room 435 of the Smith Memorial Student Union (voice phone: 503-725-4150; TTY: 503-725-6504; e-mail: drc@pdx.edu), to coordinate reasonable accommodations if you are a student with verifiable documentation.
Ethics and Integrity: It is anticipated that the student is enrolled in this course to expand his/her knowledge of the physical sciences by learning the nature and importance of chemical bonding. This course seeks not only to acquaint its pupils with basic and advanced pedagogical models of bonding, but also to encourage independent critical thinking and the further development of problem solving and career skills (e.g., interacting with peers, participating in scientific discussion, scientific critical reading, and speaking to/with a scientific audience). To achieve this mission, problem sets related to lecture material, a short lecture on a relevant paper of interest to the (graduate) student, and an satisfactory completion of in-class laboratory activities and discussions will be required for satisfactory completion of this course. It is anticipated that students will benefit from discussions of course material with their peers outside of testing periods. However, the student will maximally achieve the learning objectives of this course if his/her own work is submitted for analysis. Plagiarism (passing off someone else’s work as your own, or not citing someone else’s work appropriately) and other forms of cheating will be handled strictly and in accordance with the PSU Student Conduct Policy.