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 science 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).

CH 412/512 (Advanced Inorganic Chemistry II) further examines features of molecular inorganic compounds (particularly, coordination compounds), organometallic compounds, and bioinorganic compounds; CH 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) are recommended.

Instructor: Andrea M. Goforth, Ph.D.
Office: 207 A, Science Building 1
Email: agoforth@pdx.edu (do NOT email me at my D2L address)
Telephone: 503-725-3838

Lecture: Mondays, Wednesdays, and Fridays, 10:15 - 11:20 am, NH 307
Office Hours: Mondays, Wednesdays and Fridays, 11:30 am - 12:00 pm, others available by appointment

Important Class Dates:
Mid-term Exam Date: Wednesday, October 30, 10:15 am – 11:20 am
Symmetry Scavenger Hunt: Monday, November 4, 10:15 am – 11:20 am
Final Exam Date and Time: Wednesday, December 11, 10:15 am – 12:05 pm

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

**Required Access (All):** D2L, which will be used to post handouts, homework assignments, due dates, class announcements, etc.

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 30, 10:15 am – 11:20 am): 100 points

**Final Exam** (1 final exam, Wednesday, December 11, 10:15 am – 12:05 pm): 150 points

**Homework Sets:** 100 points (~14 assignments, grad; ~10 assignments, undergrad)

**Graduate and Undergraduate 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 completion of the accompanying project (30 points)): 100 points

**Graduate X-ray Diffraction Laboratory** (scheduled one-on-one with Dr. G., dates TBA): 50 points

**Graduate X-ray Diffraction Out-of-Class Exercise & Report** (due date, TBA): 50 points

For both the Mid-Term Exam and the Final Exam, graduate and undergraduate students will have different tests, with different levels of difficulty. The total possible points for undergraduate students is 450; two additional required activities make the total possible points for graduate students 550. Graduate students must complete ~4 additional “Voices of Inorganic Chemistry” homework assignments for credit, while undergraduate students may do them for extra credit (4 points/each).

**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 (SRTC 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 inorganic chemistry. This course seeks not only to acquaint its pupils with basic and advanced concepts in inorganic chemistry, 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). 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. Where group work is allowable and/or encouraged, all participants should be listed on the work each individual submits for analysis. Plagiarism (passing off someone else’s work as your own, or not citing/crediting someone else’s work appropriately) and other forms of cheating will be handled strictly and in accordance with the PSU Student Conduct Policy. PSU’s Code of Student Conduct and Responsibility can be found at the following site on the world wide web: http://www.pdx.edu/dos/psu-student-code-conduct.