

# CHE 385: Inorganic Chemistry II

## Course syllabus

Spring 2008

MTWF 9:00 – 9:50 am

Confer room 124

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**Introduction:** Inorganic chemistry II is a technical elective that can be taken as part of the chemistry major and is a required course for the professional chemistry track at Gustavus. Topics include transition metal chemistry, bioinorganic chemistry, materials chemistry, organometallic compounds and catalysis. A major emphasis of the class is the symmetry and group theory approach to molecular orbital theory, donor-acceptor theories, and the electronic spectra, magnetic properties, and reaction mechanisms of coordination compounds. Prerequisites: CHE-258, CHE-371 and MCS-122.

The primary goal of this course is to broaden and deepen your understanding of inorganic chemistry in the areas described above. Another significant course goal is to refine your scientific skills in general. You will identify interesting scientific questions within inorganic chemistry and design experimental approaches to tackle those questions. You will engage in several aspects of experimentation; working out protocols without a lab manual, choosing appropriate control experiments, interpreting your results in the context of the scientific literature, and communicating scientific information effectively. You will improve your ability to utilize your knowledge of chemical principles to construct solid logical arguments to explain and predict the results of inorganic chemistry experiments.

**Office hours:** Drop in or make an appointment. I intend to challenge you, but I also intend to help you succeed, so come see me if you have any questions about any aspect of this course—the material, the assignments, or anything else that comes up.

### **Course materials:**

- *Required text:* Miessler & Tarr, Inorganic Chemistry, 3rd ed., Prentice Hall
- *Required materials:* Bound lab notebook (one per laboratory group) and goggles
- *Recommended materials:* Model kit suitable for inorganic chemistry
- *Recommended text:* ACS Style Guide (also on reserve)

### **Online materials (Moodle):**

- Class, lab, and assignment schedule (updated frequently)
- All course handouts
- Assignment information
- Rubrics for homework and assignment grading (include general feedback)
- Links to helpful web sites and journals

### ***Materials on reserve in the library:***

- ACS Style Guide, edited by Dodd (on permanent library reserve)
- Molecular Symmetry and Group Theory, Carter
- Molecular Symmetry and Group Theory, Vincent (several copies)
- Chemical Structure and Bonding, DeKock and Gray
- Inorganic Chemistry, Huheey, Keiter, and Keiter
- Physical Methods in Inorganic Chemistry, Drago
- Physical Methods in Bioinorganic Chemistry, Que
- Inorganic Chemistry, Wulfsberg
- Inorganic Biochemistry, Cowan
- Solutions to homework problems and chapter problems (purple binder)

***Class time:*** To maximize the value of our class time, check the schedule on Moodle weekly to find the readings for the upcoming week (which may include library reserve items). In some cases, you will need to learn or review material outside of class time. Additionally, a very significant portion of class time will be spent on topics not fully covered in your textbook.

I assume each of you is planning to attend every class session. There are, of course, valid reasons for missing class, and I have no interest in policing these reasons. That said, be forewarned that the nature of this class makes it very difficult to keep up without regular attendance. To earn high marks in participation you will come to class and class activities well prepared and participate regularly and thoughtfully in discussions, workshops, and other activities. Laboratory absences must be approved by me in advance.

At any time, you are welcome and encouraged to bring to class a short (~5 minute) prepared presentation that relates to the day's subject matter. I will award extra credit for presentations of scientific articles and laboratory results. Depending on the quality and relevance, you can earn up to 1% added to your final grade (max 3% total). Please give advance notice—an email to me the night before is fine.

***Homework:*** Homework will be assigned to help you learn course material and practice your critical thinking skills. You are encouraged to work with other class members on homework assignments, but you must turn in your own work. Using a solutions manual from any source to help you complete the homework is a violation of the honor code. Rubrics and general feedback will be posted on Moodle after homework assignments are graded. Answer keys (including answers to all end-of-chapter questions) will be posted after homework is turned in.

***Exams:*** There will be 4 exams, including a final. All exams will be at least partially comprehensive. Exams in this class typically consist of a short in-class (closed-book) portion and a longer take-home portion. The most likely exam weeks are 2/26, 3/19, 4/23. The final exam is scheduled for 5/22 at 8-10 am.

***Written assignments:*** This course is designated WRIT-D (or WRIT). Writing assignments will include two short summaries of scientific articles, a research proposal, and a final paper written jointly by all members of your lab group. Less formal written communication will be assessed in the homework assignments, exams, and laboratory notebook.

**Speaking assignments:** You will each give a seminar on a topic of your choice within inorganic chemistry (about 25 min). This topic may be related to your proposal topic and will be based on readings that you will do in inorganic chemistry books and textbooks, and the current scientific literature. Practice talks will be required. See the “classroom” section for another opportunity to practice your speaking skills and earn extra credit.

**Laboratory:** Laboratory meets on Mondays from 2:30 – 6:30 pm in Nobel 306. Your laboratory grade will be based on participation, experimental design, and your group laboratory notebook. Please refer to the lab syllabus for more information.

**Grades:** Grading may be flexible if I feel the grades do not reflect the level of achievement with respect to the course goals. *Most likely* breakdown:

A	94-100%	
A-	90-93%	Homework: 7.5%
B+	87-89%	Exam1: 12.5%
B	83-86%	Exam2: 12.5%
B-	80-82%	Exam3: 12.5%
C+	77-79%	Final exam: 15%
C	73-76%	Participation: 5%
C-	70-72%	Seminar: 5%
D	60-69%	Writing: 15%
F	< 60%	Lab: 15%

**Honor code:** As members of the Gustavus Adolphus College community of scholars, you and I have agreed to abide by an excellent honor code. This code enhances a culture of trust between us. **I trust that you all enter this class with intentions of total academic honesty, but I also recognize that learning the finer points of academic honesty is part of your college education.** Sometimes, the details of academic honesty are not perfectly clear to students, particularly in writing assignments; please come to me with any questions you may have.

Under our code, you are not expected to police others’ actions, but you are expected to report violations of which you become aware. Every effort will be made to keep such reports confidential. Keeping silent about honor code violations is itself an honor code violation.

Any student found in violation of the academic honesty policy and honor code will receive a grade of 0 for that quiz, lab report, or final exam. A second offense will result in an F for the course. The Provost will be notified of all offenses.

**Accommodations:** If you have specific physical, medical, psychiatric, attentional, or learning disabilities and require accommodations to help you fulfill course expectations, please let me know as soon as possible so that your learning needs may be appropriately met. You will need to provide documentation of your disability to Laurie Bickett in the Academic Advising Center. Discussions will remain confidential.