

CHE 385: Inorganic Chemistry II

Course syllabus

Spring 2009

MTWF 9:00 – 9:50 am

Confer room 222

Dr. Brandy Russell
205A Nobel Hall
933-6160
brussell@gustavus.edu

Introduction: Inorganic chemistry II is a technical elective that can be taken as part of the biochemistry or 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 apply 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. Please note that I am not available in the mornings before class.

Course materials:

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

Online materials (Moodle):

- Class, lab, and assignment schedule (updated frequently)
- All course handouts
- Assignment information
- 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
- Inorganic Chemistry, Wulfsberg
- Inorganic Biochemistry, Cowan
- Solutions to homework problems and chapter problems (purple binder)

Materials in the lab “reference drawers”:

- Physical Methods in Inorganic Chemistry, Drago
- Physical Methods in Bioinorganic Chemistry, Que
- Laboratory Introduction to Bio-inorganic Chemistry, Ochiai and Williams
- Synthesis and Technique in Inorganic Chemistry, Angelici
- Synthesis and Technique in Inorganic Chemistry, Girolami, Rauchfuss, and Angelici
- The Synthesis and Characterization of Inorganic Compounds, Jolly
- Experimental Methods in Inorganic Chemistry, Tanaka

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. 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. Laboratory absences must be approved in advance.

Participation: To earn high marks in participation you will come to class and lab activities well prepared and participate regularly and thoughtfully in discussions, workshops, and other activities. In addition, completion of homework assignments and satisfactory performance on quizzes contribute to your participation grade.

Written assignments: This course is designated WRIT-D (or WRIT). You will be writing two short summaries of scientific articles and a research proposal. For some assignments, you will be expected to turn in one or more drafts before the final version; no points will be awarded unless/until you submit all drafts. Less formal written communication will be assessed in the homework assignments, exams, and laboratory notebook.

Exams: There will be 4 exams, including a final exam. All exams will be at least partially comprehensive. Exams typically consist of a short in-class (closed-book) portion and a longer take-home portion. The most likely exam weeks are 3/6, 4/14, and 5/8. The final exam is scheduled for Friday, 5/22 at 8-10 am.

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

Homework: Homework will be assigned to help you learn course material and practice your critical thinking skills (I anticipate ~8 assignments total). You are encouraged to work with other class members, but you must complete the assignment for yourself. Homework assignments will be turned in at the beginning of class on the due date, and answers to select questions will be discussed during class. Grades for homework assignments will be based on a check +/- system, based on completeness. Using a solutions manual from any source to help you complete the homework is a violation of the honor code. Answer keys (including answers to all the end-of-chapter questions from the textbook) will be posted in the library reserve binder after homework is turned in. Late homework is not accepted; if you must miss class on the day homework is due, turn your assignment in early.

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%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D	60-69%
F	< 60%

<i>Exam1:</i>	12.5%
<i>Exam2:</i>	12.5%
<i>Exam3:</i>	12.5%
<i>Final exam:</i>	15%
<i>Participation/ HW/quizzes:</i>	7.5%
<i>Writing:</i>	20%
<i>Lab:</i>	20%

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 assignment or 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.