

Chemistry 511 – Inorganic Chemistry

Fall 2004

KEEP THIS SYLLABUS FOR FUTURE REFERENCE

Inorganic Chemistry: 3 credit hours
Lecture: 11:00 – 11:50 am M,W,F, 2373 Chemistry

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(please put Chem 511 in the subject heading)
Office Hours: T, W 12:00 – 1:00 pm (Room 5108)

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Office Hours: R, F 1:30 – 2:30 pm (TA Office, Desk 42)

Lecture Homepage: <http://genchem.chem.wisc.edu/inorganic/course.htm>

REQUIRED MATERIALS:

Textbook: *Inorganic Chemistry*, Miessler, G.L. and Tarr, D.A., 3rd edition, Pearson Prentice Hall, Upper Saddle River, N.J., 2004. You can borrow a copy of this book from Chemistry Library for one semester while taking this course. Please do not mark anything on the book since we will use the same textbook for many years to come (you will be charged \$130.00 if the book returned in bad conditions).

Calculator: An inexpensive calculator with logarithmic/exponential/scientific notation capabilities is required. The calculator will be used on homework assignments, quizzes, and exams.

Class Handouts: You should obtain a copy of each handout when distributed in lecture.

COURSE INFORMATION:

This course will focus on the molecular structures and properties of inorganic complexes and compounds. We will study concepts in bonding, trends in periodic properties, molecular symmetry and its relationship to spectra, solid-state, reaction mechanisms, coordination chemistry, and descriptive chemistry of selected elements.

Lecture. Lectures organize the material, outline goals and cover the basic principles of each topic. The lecture is not intended to describe or explain everything you will learn in the course; rather, it will indicate important topics to study and will give you an opportunity to think about these topics and see if you understand them. You should take notes during lecture that reflect your understanding.

It is expected that students will read the textbook and work the problems as appropriate to augment the material presented in class.

• **Fifteen-minute quizzes and problem sets** will be given on alternate Mondays (see Schedule). The quizzes will take no more than 15 minutes and are designed to quickly assess your skill in applying the tools taught in class. Problem sets will be given out on Monday and due the following Monday. No make-up quizzes will be given, the lowest quiz score will be dropped in calculating the final grade.

Exams. There will be a 75 minute midterm exam and a two-hour final exam scheduled as in this syllabus. If you have any conflict, please let me know as early as you can. The final exam will focus on material covered in the second segment of the course but you may have to use concepts from past material but no direct questions. The location of each exam will be announced later. The exam schedule is:

Midterm exam	Monday, Oct. 25	5:30 – 7:00 pm
Final exam	Monday, Dec. 20	2:45 – 5:00 pm

Research paper. You will work in group of four students to study a research topic of your choice, write up a report, and present it in class. Each group will have 15 minutes to present its study to class. The presentation can be done with Microsoft Power Point format. (You will have one session on **Oct. 1** to learn “Library Skills in Chemistry” from Emily Wixson, Educational Resource Librarian). A copy of the articles, and your research paper are due in class on **Nov. 24**. Presentations and discussions will take place from **Dec. 8**. It is important that everyone participate in these discussions. More detail concerning this project will be given to you as the semester proceeds.

RESOURCES

Electronic Mail (e-mail). Contact me via e-mail if you have questions or comments about the course or the work you are doing. I will respond to all messages, either directly via e-mail or, when appropriate, in the next lecture. E-mail is available at all times of day and night, so you can send messages whenever something comes to mind.

My email address is: nttran@chem.wisc.edu, please put Chem 511 in the subject heading.

Web Site. Resource material for this lecture is available on the web. The homepage for my lecture includes: information about the course; **the course syllabus; copies of handouts; copies of old quizzes, problem sets and exams; and answer keys for quizzes, problem sets and exams of this class.** The address to access this material is on page 1.

Study Groups. You may collaborate with other students on homework assignments. Study groups reflect the teamwork inherent in the way modern science is done. It is important to realize that although you may collaborate with other students on assignments, the work you turn in must be your own. Thus, **you must turn in an individual write-up (not a copy of the study group's work) of homework.**

Students with Disabilities

Students with disabilities should contact Dr. Tran as soon as possible at the beginning of the semester to arrange accommodations. This applies to lecture and special accommodations for exams.

GRADES

Best 5 of 6 quizzes	5 x 20	100 points
Problem sets	5 x 20	100 points
Research paper*		30 points
75-minute exam		100 points
Final exam		170 points

Maximum score 500 points

* Research paper will be graded in "low-resolution" fashion: a "30" for an excellent study; a "20" for a good study; a "10" for a fair study; and "0 " for no effort.

Letter grades will be assigned at the end of the semester based on the following scale:

A	450–500 points	(90%)
AB	435–449 points	(87%)
B	400–433 points	(80%)
BC	385–400 points	(77%)
C	325–384 points	(65%)
D	250–324 points	(50%)

Final grades will be based upon an absolute scale. Thus, if you earn a total of 450 points, you are guaranteed an A, no matter how many other students earn that number of points. You are competing against this scale, not against other students, and it is to your benefit to help each other.

Review Your Grades. Your grades will be entered electronically in the WebCT and available to you so you can check our records for accuracy. To maintain confidentiality, you will be required to enter your ID number.

Tentative Course Outline

<i>Date</i>	<i>Topic</i>	<i>Textbook Reference</i>	
F, Sep 3	Introduction and Review	Chapter 1	
M, Sep 6	LABOR DAY		
W, Sep 8	Atomic Structure and Properties	Chapter 2	
F, Sep 10	Atomic Structure and Properties	Chapter 2	
M, Sep 13	Bonding Theory	Chapter 3	Quiz 1
W, Sep 15	Bonding Theory	Chapter 3	
F, Sep 17	Symmetry and Group Theory	Chapter 4	
M, Sep 20	Symmetry and Group Theory	Chapter 4	PS 1 (due)
W, Sep 22	Symmetry and Group Theory	Chapter 4	
F, Sep 24	Symmetry and Group Theory	Chapter 4	
M, Sep 27	Symmetry and Group Theory	Chapter 4	Quiz 2
W, Sep 29	Symmetry and Group Theory	Chapter 4	
F, Oct 1	Library Skills in Chemistry		
M, Oct 4	Molecular Orbital Theory	Chapter 5	PS 2 (due)
W, Oct 6	Molecular Orbital Theory	Chapter 5	
F, Oct 8	Molecular Orbital Theory	Chapter 5	
M, Oct 11	Molecular Orbital Theory	Chapter 5	Quiz 3
W, Oct 13	Molecular Orbital Theory	Chapter 5	
F, Oct 15	Acid/Base Chemistry	Chapter 6	
M, Oct 18	Acid/Base Chemistry	Chapter 6	PS 3 (due)
W, Oct 20	Acid/Base Chemistry	Chapter 6	
F, Oct 22	Solid State: Structure and Bonding	Chapter 7	

M, Oct 25	MIDTERM EXAM 5:30 – 7:00 pm		
W, Oct 27	Solid State: Structure and Bonding	Chapter 7	
F, Oct 29	Solid State: Structure and Bonding	Chapter 7	
M, Nov 1	Descriptive Chemistry	Chapter 8	Quiz 4
W, Nov 3	Descriptive Chemistry	Chapter 8	
F, Nov 5	Descriptive Chemistry	Chapter 8	
M, Nov 8	Coordination Chemistry II	Chapter 9	PS 4 (due)
W, Nov 10	Coordination Chemistry I	Chapter 9	
F, Nov 12	Coordination Chemistry I	Chapter 9	
M, Nov 15	Coordination Chemistry I	Chapter 9	Quiz 5
W, Nov 17	Coordination Chemistry II	Chapter 10	
F, Nov 19	Coordination Chemistry II	Chapter 10	
M, Nov 22	Coordination Chemistry III	Chapter 11	PS 5 (due)
W, Nov 24	Coordination Chemistry III	Chapter 11	Research Paper
F, Nov 26	Thanksgiving Break		
M, Nov 29	Organometallic Chemistry	Chapter 13	
W, Dec 1	Organometallic Chemistry	Chapter 13	
F, Dec 3	Organometallic Reactions	Chapter 14	
M, Dec 6	Bioinorganic Chemistry	Chapter 16	Quiz 6
W, Dec 8	Class Presentations		
F, Dec 10	Class Presentations		
M, Dec 13	Class Presentations		
W, Dec 15	Class Presentations		
M, Dec 20	FINAL EXAM 2:45 – 5:00 pm		