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Fall 2008

***Inorganic Chemistry***  
**CHM 3610C**

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Lecture  
MWF 10:00 - 10:50 am  
Building 50, Room 1402  
Lab  
Friday 12:00 - 3:50 pm  
Building 50, Room 3608

Office Hours

MW 8:00-10:00 am, 11:00-noon

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**Course Information and Requirements**

**Course Goals and Objectives**

- Provide experimental evidence and theoretical interpretations of the properties and reactions of elements and inorganic compounds.
- Introduce concepts relating to molecular symmetry.
- Introduce concepts relating to the bonding forces that underlie molecular structure.
- Enhance and broaden your repertoire of synthesis and characterization techniques as related to inorganic chemistry.

**Required Materials:**

In pursuit of the objectives outlined above, the course will utilize the following:

Textbook: "Inorganic Chemistry", Catherine E. Housecroft and Alan G. Sharpe (3<sup>rd</sup> Edition, ISBN 978-0-13-175553-6)

Lab Resources: Handouts will be used for the laboratory section of the course.

Safety glasses or goggles: must be worn in laboratory at all times.

Prerequisite: CHM 4410C Physical Chemistry I, CHM 3120C Quant. Analysis, and CHM 2211 Organic II.

**Web Site for Additional Information:**

<http://www.unf.edu/~michael.lufaso/chem3610/>

**Class Format:**

Lecture classes on MWF will begin promptly at 10:00 am and end near 10:50 am (50 minute lecture). It is assumed all students will be in class on time and remain until dismissed. Avoid disruptive behavior such as using cell phones, PDA, headphones, or laptops. Those with cell phones that ring during class may receive a penalty, per occurrence, to their overall course score.

The lecture class and textbook are intended to complement each other. Students are responsible for everything that is covered during the lecture class period. Each student is advised to take thorough class notes. Note that merely copying what is on the PowerPoint slides or whiteboard is not sufficient for class notes – you should also take notes on verbal explanations.

**Academic Misconduct:**

Any material submitted in Inorganic Chemistry must represent your own work and follow the Academic Integrity Code. Students supplying materials for others to "look at" (e.g. exams) may be charged with academic misconduct. The use of 'cheat sheets', stored text, constants, or formulas in calculators may be regarded as a violation of academic standards. Apparent violations of this standard will be referred to the Registrar's Office and Office of Academic Affairs.

**Homework:**

Homework will be assigned and is one of the most important study aids. I will assign specific homework problems, which should be completed. Chemistry, in particular, is a cumulative subject in which new material builds upon previous concepts. Practice is the key! Don't fall behind! It is helpful to learn from one another, through the formation of study groups, as a useful mechanism to learn difficult subject material. Make sure you independently understand the chemical and physical concepts. Your homework may be helpful in studying for the midterm and final exams.

**Exams:**

There will be two midterm exams and a final exam. Make-up exams might be given only if I heard from you (by phone or phone message) before the exam or a preapproved university conflict. Excused absences are only for reasons beyond your control and must be documented by official documentation (police report, emergency room receipt, etc.). Midterm exams are scheduled on Monday, September 29, 2008 and Monday, November 3, 2008. The final exam is scheduled on Wednesday, December 10, 2008 (9:00 am -10:50 am).

**Student Responsibility:**

Each student receives this information about Inorganic Chemistry I in the first lecture. It is your responsibility to read this material and be familiar with course content, course procedures, and grading. You are also responsible for any announcements concerning course procedures which are made in class, whether you are present or not. If you are absent, you are expected to get notes, announcements, handouts, etc. from another student in the class.

**Laboratory:**

Faculty will exercise great care to minimize, and when possible, eliminate all potential hazards, but there is potential of risk in all laboratory experiments. Although an accident is rare, it may happen. *Goggles or safety glasses are required at all times in the laboratory.* Failure to do so will result in a verbal warning and a reduction in the lab report grade, or expulsion from the laboratory. Laboratory coats are not required but are highly recommended. Food and drink are not permitted in the laboratory. Additionally, minimization of risks requires that students arrive well prepared for each lab experiment and are attentive in class. The schedule may change as necessary as equipment needs and other scheduling considerations dictate. A bound notebook is required to record all experimental data, procedures, and results. Recording data on scrap paper is not acceptable and the scrap paper is subject to immediate *recycling*.

**Tentative Schedule:** Tentative lecture topic coverage, subject to change.

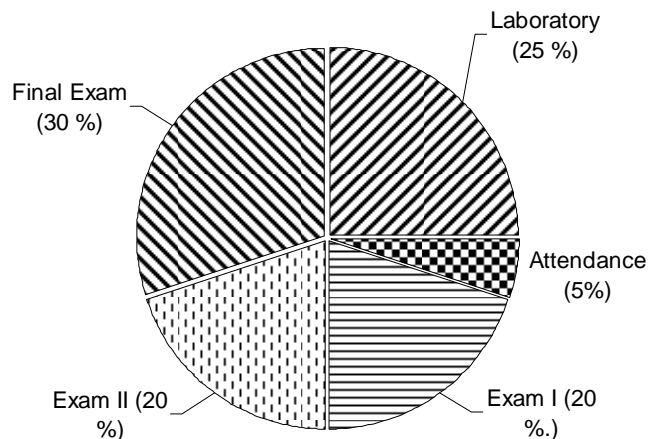
<i>Week of</i>	<i>Lecture Topic</i>	<i>Reading</i>	
1 Aug 25-29	Introduction to Inorganic Chemistry, atoms, classical quantum theory, atomic orbitals, many electron atoms	Ch. 1,2	
2 Sept 1-5	periodic table, aufbau principle, ionization energies and electron affinities; valence bond theory	Ch. 2	
3 Sept 8-12	molecular orbital theory octet rule, electronegativity, dipole moments, heterodiatomic molecules; molecular shape, stereoisomerism	Ch. 2	
4 Sept 15-19	Nuclear properties, isotopes	Ch. 3	
5 Sept 22-26	NMR, Mossbauer	Ch. 3,4	
6 Sept 29-Oct 3	symmetry operations, symmetry elements, successive operations,	Ch. 4	Exam #1
7 Oct 6-10	Point groups, character tables, vibrational spectroscopy	Ch. 4	
8 Oct 13-17	Vibrational spectroscopy, chiral molecules	Ch. 4,5	
9 Oct 20-24	Hybridization of atomic orbitals, multiple bonding	Ch. 5	
10 Oct 27-31	Ligand group orbitals triatomic and polyatomic,	Ch. 5	
11 Nov 3-7	MO theory – bonding analyses, Ligand Group Orbitals	Ch. 5	Exam #2
12 Nov 10-14	Ground state electron config., coordination numbers	Ch. 20	
13 Nov 17-21	magnetism, valence bond theory	Ch. 20	
14 Nov 24-28	coordination complexes, crystal field theory, MO theory	Ch. 21	
15 Dec 1-5	electrons in multielectron system, magnetic properties, Ligand Field Stabilization Energy	Ch. 21	
E December 10	<b>Final Exam:</b> Wednesday, December 10, 2008 (9:00 am -10:50 am).		Final Exam

Sept. 1 and Nov. 11, 27, 28 are University holidays. Last day to withdraw: Friday, November 7.

### Grading and Evaluation:

Your performance and final grade in the course will be evaluated on the basis of total points earned. The distribution of points will be based on the following:

Laboratory	25 %
Attendance	5%
Exam I	20 %
Exam II	20 %
Final Exam	30 %
<b>Total</b>	<b>100 %</b>



The course will be graded so that A: 92 - 100%; A-: 89 – 91%; B+: 87 - 88%; B: 80 – 86; B-: 78-79; C+: 76 - 77%; C: 67 – 75%; D: 55 - 66%. +/- final grades will be assigned. Final course grades will be based on a curve set by class performance. Retain all graded papers so that you can present them if you become aware of a grade recording error. Ethical behavior is expected in all work inside and out of class. A minimum score of 50% is required in lab to pass this course.

## **Helpful Suggestions or: How to Succeed**

Chemistry, in the broadest sense, is the study of the properties and interactions of matter. Chemical principles can be taught as a series of linked concepts. Procrastination, following by “all-nighters” or “cramming” often lead to lack of success. Deliberate and consistent effort will likely yield the best results. Plan to spend at least 3 hours outside of class for every 1 hour lecture. Some students will need more, some students will need less. Keep up in both chapter reading and homework problems. Don’t fall behind! You will understand the material in class better if you have read the relevant sections and chapter prior to the lecture. Work on homework problems individually initially, then in groups. Learn from each other, but remember that you will not be taking exams as a group. Make sure you understand the material and can do the problems independently; otherwise it is likely that you will do poorly on the exam. Utilize my office hours to better understand material you find particularly difficult. Take high-quality notes, and review them periodically and in the context of the text book. Practice doing homework problems, and even consider going to the library to obtain other chemistry books for additional practice problems. More practice and study of the problems, concepts, and material will help you on exams - since you will be able to answer questions more rapidly and have time to recheck your answers and calculations. I will gladly provide additional problems for practice. I desire to have each of you learn chemistry according to your ability, and also enjoy the course. *Your success in this course will largely depend on your effort and motivation!*

## **Student Learning Outcomes**

### **Content**

- Demonstrate good understanding and retention of basic chemical principles and factual knowledge in the core areas of analytical chemistry and instrumentation, biochemistry, inorganic chemistry, organic chemistry, and physical chemistry.
- Demonstrate the ability to apply basic mathematics (arithmetic and algebra) and basic chemical principles to find solutions to simple quantitative problems and situations.
- Perform laboratory experiments that are based on fundamental chemical principles and adhere to departmental standards of laboratory safety.

### **Critical Thinking**

- Apply logical thought processes and background knowledge to draw appropriate conclusions from chemically related information and data.
- Infer conclusions and consequences from experimental data.

### **Communication**

- Write professional papers in a style consistent with currently accepted scientific report structure to include proper grammar and spelling.