

Chemistry F402: Inorganic Chemistry, 3.0 Credits Fall Semester, 2009

Instructor: Dr. William A. Howard
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Lecture Meetings: Monday, Wednesday, Friday, 11:45 AM – 12:45 PM, NSF 136
Office Hours: Monday, Wednesday, Friday, 2:15 PM – 3:15 PM

Required Texts: Inorganic Chemistry, 3rd Ed. Housecroft & Sharpe; Pearson / Prentice Hall; Harlow, England: 2008.

Suggested Materials: Ball-and-stick molecular model kit, calculator

Prerequisites: Successful completion (letter grade of C or better) of Basic Inorganic Chemistry F202, Organic Chemistry F322, and Physical Chemistry F332 is required.

General Information: There are two semesters of instruction in inorganic chemistry available for undergraduate students. Chemistry F202 serves as an introduction to inorganic chemistry, while Chemistry F402 goes into more depth. The lecture will cover chapters 11 – 29 of the text book.

Lecture: A schedule of reading assignments is given at the end of this syllabus. Lectures will be conducted with the assumption that the student has read the textbook before coming to class. Not all of the material described in the textbook will be covered in each lecture; nevertheless, the student is responsible for all material described in the reading assignments.

Examinations: Three regular examinations and one final examination will be given, and each exam will be worth 100 points. All exams will be held in class and will be closed-book, closed-notes exams. Each exam will consist of 15 – 20 problems, and most or all of the problems will be taken from the homework assignments.

Make-up Exams and Absences: If a student misses a class due to sickness, personal injury, bad weather, transportation problems, or a family emergency, then that student should notify Professor Howard as soon as possible, preferably BEFORE class. That student will receive an excused absence. Make-up exams and quizzes can be given for excused absences. Homework deadlines can be extended for excused absences. If the student does not notify Professor Howard within a week of the missed class period, then that student will receive an unexcused absence, regardless of the reason for missing the class. Make-up exams and quizzes will NOT be issued for unexcused absences, such as sleeping too late, over-extended vacations, not being prepared, disputes with friends or acquaintances, or simply not coming to class.

Homework: A homework assignment consisting of five questions or problems will be assigned every day of class. The problems are based on that day's lecture. All homework will be due at the beginning of the next class period after it is assigned. Late homework assignments will be accepted, regardless of how late they are, and no points shall be deducted due to tardiness. However, answer keys to the homework problems will NOT be given to the student until the student submits his or her homework assignment. No homework will be accepted after 5:00 PM on Monday, December 14, the last day of instruction.

Each homework problem is worth 2 points. The student receives 2 points if the student's answer is totally correct, with no errors at all; the student receives a 0 on a problem if the student has neglected to do the problem or if the student's answer is completely wrong; all other answers receive a score of 1 point. Since there are five homework problems per homework set, each set is worth 10 points.

There will be a total of 37 homework sets given throughout the semester. Only the top 32 homework scores will be counted toward the grade. The total number of points from the homework is 320 points.

Grades: Grades are assigned WITHOUT the +/- indicators and are determined as shown in the following table.

Work to be Graded	Possible Points
32 homework assignments	32 x 10 points = 320 points
Exam 1	100 points
Exam 2	100 points
Exam 3	100 points
3 HyperChem Projects	3 x 10 points = 30 points
Final Exam	100 points
Total	750 points

Point Ranges and Letter Grades:	750 – 675	A
	674 – 600	B
	599 – 525	C
	524 – 450	D
	449 or less	F

Help: If the student has difficulty understanding concepts or solving homework problems, the student may visit Dr. Howard during normal office hours (*vide supra*) or make an appointment to see Dr. Howard at a more convenient time. Appointments can be scheduled by telephone or email or in person.

Academic Honesty: The Chemistry "Department Policy on Cheating" is this: "Any student caught cheating will be assigned a course grade of F. The student's academic advisor will be notified of this failing grade and the student will not be allowed to drop the course."

Calculators may be used for numerical calculations only. Plan to use a non-programmable calculator for exams. Using qualitative chemical information or quantitative examples preprogrammed on a calculator is not allowed during exams. Prof. Howard reserves the right to give you a simple calculator if you bring a programmable device with you for an exam. Feel free to discuss this on an individual basis with Prof. Howard, well before exam time.

As a UAF student, you are subject to UAF's Honor Code:

"Students will not collaborate on any quizzes, in-class exams, or take-home exams that will contribute to their grade in a course, unless permission is granted by the instructor of the course. Only those materials permitted by the instructor may be used to assist in quizzes and examinations.

Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses, and other reports.

No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors.

Violations of the Honor Code will result in a failing grade for the assignment and, ordinarily, for the course in which the violation occurred. Moreover, violation of the Honor Code may result in suspension or expulsion."

Instructor Withdrawal Policy: The instructor reserves the right to withdraw a student from this course for any of the following reasons:

1. The student is failing the course as of Friday, October 30, the last day for submitting withdrawals.
2. The student has missed Exam 1 without an excuse and has not made up this exam.
3. The student has stopped attending lectures and has not participated in class by completing any homework assignments.

Important Dates:

- Labor Day – NO CLASS Sept. 7
- Last day to drop class with 100% refund Sept. 11
- Last day for withdrawals with class not appearing on record Sept. 18
- Last day to drop class with 50% refund Sept. 18
- Freshman Progress Reports due Oct. 9
- Last day for withdrawals with student receiving "W" Oct. 30
- Thanksgiving Break Nov. 26 – 29
- Last day of class Dec. 14

More Important Information: Students with documented disabilities who may need reasonable academic accommodations must provide documentation of the disability to Disability Services in the Center for Health and Counseling, 474-7043, TTY 474-7045. Disability Services will then notify Prof. Howard in writing of the disability and will advise on how the student should be tested and which accommodations should be made.

Inorganic Chemistry F402: Schedule of Lectures

Fall, 2009, Professor William A. Howard

Week No.	Date	Reading	Classroom Lecture
1	Sept. 4	Chapters 11 and 12	Alkali and Alkaline Earth Metals
2	Sept. 7		LABOR DAY – NO CLASS!
	Sept. 9	Chapter 13	Triels
	Sept. 11	Chapter 14	Tetrels
3	Sept. 14	Chapter 15	Pnictogens
	Sept. 16	Chapter 16	Chalcogens
	Sept. 18	Chapters 17 and 18	Halogens and Noble Gas Compounds
4	Sept. 21	Pages 574 – 590	Organometallic Chemistry of Groups I, II, and III
	Sept. 23	Pages 590 – 607	Organometallic Chemistry of Groups IV, V, and VI
	Sept. 25	Chapter 20	General Considerations for d Block Chemistry
5	Sept. 28		Examination 1
	Sept. 30	Pages 637 - 644	VBT for Transition Metals, Intro to CFT
	Oct. 2	Chapter 5	Review of MO Theory
6	Oct. 5	Pages 645 - 654	CFT with Other Geometries, π Bonds.
	Oct. 7	Pages 654 – 665	Term Symbols, Electronic Absorption Spectroscopy
	Oct. 9	Pages 666 – 669	Racah Parameters, Tanabe-Sugano Diagrams
7	Oct. 12	Pages 670 – 682	Magnetic Properties, Lattice Energy and CFT
	Oct. 14	Pages 686 – 699	Descriptive Chemistry Sc – V
	Oct. 16	Pages 699 – 722	Descriptive Chemistry Cr – Fe
8	Oct. 19	Pages 722 – 741	Descriptive Chemistry Co – Zn
	Oct. 21	Pages 744 – 759	Descriptive Chemistry Y, La – Nb, Ta
	Oct. 23	Pages 759 – 783	Descriptive Chemistry Mo, W – Ru, Os
9	Oct. 26	Pages 783 – 803	Descriptive Chemistry Rh, Ir – Cd, Hg
	Oct. 28	Handout	Electron Count, Valence, Ligand Bond Number
	Oct. 30	Pages 806 – 827	Metal Carbonyls, Wade's Rules
10	Nov. 2	Pages 827 – 832	Organometallic Reaction Types
	Nov. 4	Pages 832 – 849	Cyclic Hydrocarbon Ligands
	Nov. 6	Chapter 25	f Block Chemistry
11	Nov. 9	Page 880 – 895	Ligand Substitution Reactions and Kinetics
	Nov. 11	Pages 895 – 900	Electron Transfer Mechanisms
	Nov. 13		Examination 2
12	Nov. 16	Chapter 27	Important Industrial Catalytic Processes
	Nov. 18	Handout	Haber-Bosch Catalysis
	Nov. 20	Handout	Homogeneous Modeling of HDS

13	Nov. 23	Pages 938 – 947	Defects and Superconductors
	Nov. 25	Pages 947 – 953	Ceramics and Semi-conductors
	Nov. 27		THANKSGIVING BREAK – NO CLASS!
14	Nov. 30	Pages 953 – 960	Fibers and Carbon Nanotubes
	Dec. 2	Pages 962 – 971	Biological Metal Storage and Transport
	Dec. 4		Examination 3
15	Dec. 7	Pages 971 – 978	Hemes
	Dec. 9	Pages 978 – 995	Biological Redox Processes and Zinc Enzymes
	Dec. 11	Handout	Bio-organometallic Chemistry
16	Dec. 14	Handout	Vanadium Biochemistry
	Dec. 16	10:15 AM – 12:15 PM	Final Examination