

C He m I stry of the Eleme N ts

Spring 2014

Chem 2131

Instructor- Dr. Deborah Mitchell

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Office- SGM 251 & AAC 350 (second floor of library directly above UTS help desk).

Lectures: M, W, F 8:00-8:50 BAUD 101

Test Reviews: Held on listed Thurs 8:00-8:50 in BAUD 101

Office Hours (Science and Engineering Center): M 10 AM-noon, W 1 PM, or by appt.

****Please note that if I am available in the Science and Engineering Center to answer questions about lab and lecture. If would like to meet to discuss your grade, please set up an appointment with me in my office****

Text: Inorganic Chemistry, Shriver, 6th Edition (you are welcome to use an older edition).

Sapling Account: Homework will be performed online using the *Sapling* system This is required for purchase (\$30 for the quarter). Detailed instructions are posted on canvas.

Calculator: An inexpensive calculator is required. It should have the capabilities for square roots, logarithms, and exponential (scientific) notation operations. The calculator will be used for homework, quizzes, and exams. **Bring your calculator to class each day to work problems.** You are responsible for understanding how to use your own calculator.

Top Hat: In-class participation and some quizzes will be facilitated with Top Hat, a web-based response system. Top Hat allows you to use your cell phone or computer to respond to questions during class. Students are responsible for purchasing a license for Top Hat. The cost is \$20 for access for one quarter or \$38 for access for 5 years. Go to TopHat.com to register. A detailed list of instructions is posted in canvas.

Course Objectives: Each student will learn principles such as coordination chemistry, descriptive chemistry, solid-state chemistry, ideal gases, and nuclear chemistry. Students will use their knowledge of these concepts to address chemical problems. Part of this course will focus on communicating science to a broader audience. Associated goals are to sharpen critical thinking and develop a solid basis for future study in molecular sciences.

Canvas: canvas.du.edu will be the website that you can find all of the online aspects of this course. Please look at the weekly checklist to keep track of tasks.

Lectures/Recitations: A lecture schedule is below. As a student you will be expected to read and study the assigned material before each lecture. Class members are encouraged to take an active part in class lectures. During recitation sessions, questions and problems will be addressed relating to recent material.

Weekly Assignments: Each week, problems related to the lecture material will be assigned. You are required to submit problem sets via an online homework system called Sapling (<http://saplinglearning.com>). Assignments will be due every Friday at 6 PM. If your homework is late, you will be docked 10% of points for each business day late until 50%. Late assignments turned in any time after 5 days late will be scored for ½ credit. Computer problems as an excuse for not turning in an assignment will not be tolerated. A tech TA supplied by Sapling will be able to answer your technical questions about log-in issues or non-academic problems with homework questions. Email: support@saplinglearning.com

Communicating Science: This quarter you will have an assignment where you practice communicating science. The details of this assignment are TBA.

Non graded problem sets: Problem solving is an important component of all chemistry and most science courses. For most students, successfully solving problems requires practice. In addition to completing the example exercises in the text, I will post problem sets to help you practice. These will not be graded, but the solutions will also be posted. Exam questions may be taken from, or may closely follow these problem sets.

Student-Centered Fridays: Every Wednesday, an online lecture will be posted to canvas. It is your responsibility to watch this lecture before class on Friday. There will be a quiz in canvas to gauge comprehension. Friday will be used as a time to go through problems associated with material in online lecture.

Science and Engineering Center: Need extra help? The Science and Engineering Center is a collaborative space staffed by undergraduate and graduate TAs trained to assist students with first and second year chemistry, physics, computer science and engineering lecture and laboratory courses. Our goal is to help students grow as problem solvers by assisting with homework sets, lab reports, and preparing for exams. The Science and Engineering Center is **not** a one-on-one tutoring center, but is rather a support system where students can get guidance from TAs as well as their peers. This center is open to all DU students. All services are free. Located in the north-west corner of the first floor of the Anderson Academic Commons (west of the writing center). See <http://portfolio.du.edu/sec> for a complete schedule for all disciplines served.

Exams:

- a) There will be two one-hour midterm exams and a final exam. Exam review times will be TBA.
- b) If anyone for any reason had to take the exam outside of the scheduled time, arrangements need to be made with the instructor at least one week in advance. Instructor approval of the situation is necessary for any adjustment in exam schedule to occur.
- c) If any student is a member of the DSP or LEP programs and feels they need special accommodations for exams, please contact the instructor.
- d) **All exams will be comprehensive encompassing lecture materials, assignments, and laboratory material. The exams are designed to test your ability to apply the concepts covered in the lecture.**
- e) **If your grade on your final exam is higher than one of your midterm exams, your final exam will be counted twice to replace your lowest midterm grade.**

Grading:

The breakdown of the course grades is as follows:

HW	100 points
Quizzes	50 points
Top Hat	50 points
Sci Comm	100 points
Exam 1	200 points
Exam 2	200 points
Final Exam	200 points
TOTAL	900 points

Grades will be based on the following approximate grade scale:

94%	A	74%	C
90%	A-	70%	C-
87%	B+	67%	D+
84%	B	64%	D
80%	B-	60%	D-
77%	C+	<60%	F

Students who earn at least 94% of the possible points are guaranteed an A in this class; however, it may not be necessary to earn 94% to receive an A since this scale may be modified downward at the discretion of the instructor. Scores will be recorded on Canvas as they are graded. Grades on canvas will not be weighted correctly. Each student should check canvas frequently to make sure scores are recorded correctly. Complaints on grading or recording errors should be made within two weeks of each exam.

Help

Students who need help in this class have several options:

- (1) The Science and Engineering Center, located on the first floor of the library, is a great resource! TAs are available throughout the week to answer questions on both lecture and lab material.
- (2) The instructor has office hours for consultation. If you cannot make the set office hours, you can schedule an appointment.
- (3) Peers (Study Groups): Take opportunities to help those around you and to ask for help. You can learn a lot from your fellow classmates. If you come to the Science and Engineering Center, perhaps you will find a group of classmates to study with!

TAs and the instructor are willing to help anyone in need. There is no excuse for not getting help. Your best help may come from your fellow students. Meeting regularly with a study group, for discussing ideas and working together on homework will be one of the best helps in learning and understanding the material. Even if you don't think you need the help from others, you will often find that teachers learn more than the students.

Formula for Success: (a partial list)

- 1.) Study topics in textbook before class
- 2.) Attend class regularly
- 3.) Be ready to ask questions... and ask them!
- 4.) Take notes on content learned in lecture
- 5.) Work on assigned problems before the recitation session
- 6.) Study with other students in the class
- 7.) Get help from course instructor
- 8.) Don't get behind

Academic Honesty in Chemistry of the Elements:

- 1.) You are encouraged to study with other students in preparing for exams and discussing assigned problems to be submitted as homework.
- 2.) However, each student is required to provide their own work on homework and exams. Copying an exam or homework is a violation that will not be tolerated in this class, and a zero will be given for the assignment or exam. Repeated offences will result in failure of the course.

Tentative Schedule of Lecture Topics

Date	Lect	Chap. Sec	Topic
3/23 (M)	1	4.1, 4.6–4.10	Brønsted-Lowry and Lewis Acid-Base Theory, HSAB
3/25 (W)	2	7.1	Introduction to Coordination Chemistry: Coordination, Ligands, and Structure
3/27 (F)	3	7.2	Nomenclature of Coordination Compounds
3/30 (M)	4	7.3–7.11	Structure and Isomerism
4/1 (W)	5	7.3–7.11	Structure and Isomerism
4/3 (F)	6	7.12–7.15	Chelate Effect, Steric Effects, Formation constants
4/6 (M)	7	20.1	Crystal Field Splitting, Spectrochemical series
4/8 (W)	8	20.1, 20.2b	Magnetic Properties and Absorption Spectroscopy/ Color, Pi backbonding
4/10 (F)	9	21.1–21.3	Reactions of Coordination Complexes, Rates and mechanisms
4/13 (M)	–	–	EXAM #1
4/15 (W)	10	19.1–19.12	Applications of Coordination Chemistry
4/17 (F)	11	26.5–26.8	Bioinorganic Applications of Coordination Chemistry
4/20 (M)	12	3.1–3.3	Properties of Solids: Ionic, Network, and Molecular crystals
4/22 (W)	13	3.9–3.10	Solid-state structures: Crystal Lattices and Unit Cells
4/24 (F)	14	3.11–3.15	Ionic Solids: Lattice Energy
4/27 (M)	15	3.15–3.20	Lattice Energy: Thermodynamics and electronic Structure
4/29 (W)	16	9.1–9.7	Periodic Trends: Ionic Radii, Electronegativity, etc.
5/1 (F)	17	9.8–9.9	Uniqueness principle, Diagonal Effect, Inert Pair Effect
5/4	18	Supplemental	Hydrogen Isotopes and Nuclear Reactions

(M)		Material	
5/6 (W)	19	Supplemental Material	Nuclear Radiation and Energy
5/8 (F)	20	5.1–5.5	Oxidation-Reduction Review
5/11 (M)	–	–	EXAM #2
5/13 (W)	21	11.1–11.5	Group 1A: Alkali Metals and Redox Review
5/15 (F)	22	12.1–12.5	Group 2A: Alkaline Earth Metals
5/18 (M)	23	13.1–13.15	Group 3A Elements
5/20 (W)	24	14.1–14.15	Group 4A Elements
5/22 (F)	25	15.1–15.17	Group 5A Elements
5/25 (M)	26	–	No class, Memorial Day
5/27 (W)	27	16.1–16.16	Group 6A Elements
5/29 (F)	28	17.1–17.6 18.1–18.11	Halogens and Nobel Gases
06/01		FINAL EXAM	Monday June 1st 8–10AM