

Chemistry of the Elements
CHEM 2131 Section 1
Spring Quarter, 2021



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Lecture: MWF 9:00 a.m. – 9:50 am (Online)

Recitation: T 9:00 a.m. – 9:50 am (Online)

Office Hours: By appointment. Please email for appointments.

Required Text:

https://chem.libretexts.org/LibreTexts/University_of_Denver/Chem_2132%3A_Chemistry_of_the_Elements

Chemistry: The Molecular Nature of Matter and Change -8th Edition by Martin Silberberg (Author), Patricia Amateis

<https://openstax.org/details/chemistry#resources>

Course Objective:

We will continue to build on basic chemical concepts covered in general chemistry I and II, and then introduce the field of inorganic chemistry. Our focus would be understanding chemical principles in coordination chemistry, solid state chemistry, electrochemistry, nuclear chemistry, and chemical properties of main group 2A – 8A elements.

Lectures: The lectures will generally follow selected sections of the textbook and the online text materials (see schedule). Most lectures will be presented electronically using ZOOM and on PowerPoint slides. ***Attending every class and taking meaningful notes is incredibly important for this class. Keeping up with the reading will help you better understand the lectures and take more meaningful notes.*** Also, we will work through problems during lectures and recitations to help you understand each concept and build the necessary problem solving skills required to excel in the class.

Recitation: Tuesday recitations will give us an opportunity to go over challenging problems from the homework assignments or review particular topics. We may use some recitation sections for lectures. There may also be short quizzes (1-2 questions, ~20 min) that could be worth bonus point.

Homework: Homework is essential for developing the desired skills you will need to succeed in this class. The homework would be pulled from the study materials in class and required text.

- **Assigned Homework:** There will be weekly problems posted on Canvas. **You are to submit solutions to the homework problems by 5 pm on Mondays** of each week except the first and last Mondays of the quarter.

Homework for the quarter is worth 200 points (25% of your total grade)

Calculator: Any simple or graphing calculator would be sufficient for calculations covered in this course.

Exams: There will be two midterm exams during the quarter, each worth 200 points and a final exam also worth 200 points. If your final exam score is higher than either midterms, the lowest score will be dropped and replaced with your high final exam score.

Final Grade: Your final grade will be determined out of the 800 available points earned from exams and homework (plus all earned bonus points). **There will be no makeup exams.** If you miss an exam for any reason, that exam will be dropped and the final will count for 200 points. **The final exam is not optional – NO EXCEPTION**

Grade	Range	Grade	Range
A	100 – 94 %	C-	<74 – 70%
A-	<94 – 90%	D+	<70 – 67%
B+	<90 – 87%	D	<67 – 64%
B	<87 – 84%	D-	<64 – 61%
B-	<84 – 80%	F	<60 – 0%
C+	<80 – 77%		
C	<77 – 74%		

Note: Final grades and percentage ranges are subject to change by the instructor

Lecture and Testing Accommodations:

I will make every effort to accommodate students diagnosed with a learning disability. I will do this in complete confidence. I do, however, request that any student requiring these accommodations inform me the first week of class. For further information, please see the University Disability Services' website at <http://www.du.edu/disability/dsp/index.html>.

Academic Integrity:

While I advocate collaborative learning and teamwork, I also firmly believe that everyone should maintain the highest ethical standards. As such, I support and will strictly enforce the Honor Code of the University of Denver. www.du.edu/honorcode.

Honor Code Statement.

All members of the University of Denver are expected to uphold the values of *Integrity*, *Respect*, and *Responsibility*. These values embody the standards of conduct for students, staff, faculty, and administrators as members of the University community. These values are defined as:

Integrity: acting in an honest and ethical manner;

Respect: honoring differences in people, ideas, and opinions;

Responsibility: accepting ownership for one's own conduct.

Pioneer Pledge.

As a University of Denver Pioneer I pledge...

- to act with INTEGRITY and pursue academic excellence;
 - to RESPECT differences in people, ideas, and opinions and;
 - to accept my RESPONSIBILITY as a local and global citizen;
- Because I take pride in the University of Denver I will uphold the *Honor Code* and encourage others to follow my example.

Topics to be covered: Tentative Course Schedule – Subject to Change

Weeks	Date'21	Topic	Reading	Due
Wk1		Brønsted-Lowry and Lewis Acid-Base Theory, HSAB	OS: 15.2	
	W- 03/31	Introduction to Coordination Chemistry: Coordination, Ligands, and Structure	Ch23 OS: 19.1,	
	F – 04/02	Nomenclature of Coordination Compounds	Ch23, OS:19.2	
Wk2	M - 04/05	Structure and Isomerism	Ch23, OS:19.2	
	W - 04/07	Structure and Isomerism	Ch23, OS:19.2	
	F - 04/09	Coordination Bonding Theory	Ch23, OS: 19.3	
Wk3	M - 04/12	Crystal Field Splitting, Spectrochemical series	Ch23, OS: 19.3	HW1
	W - 04/14	Magnetic Properties and Absorption Spectroscopy/ Color	Ch23, OS: 19.3	
	F - 04/16	Applications of Coordination Compounds	Ch23,	
Wk4	M - 04/19	EXAM #1		HW2
	W - 04/21	Bioinorganic Applications of Coordination Chemistry	CW: 6.1-6.4	
	F - 04/23	Properties of Solids: Ionic, Network, and Molecular crystals	Ch12.6	
Wk5	M - 04/26	Solid-state structures: Crystal Lattices and Unit Cells and Lattice Energy	Ch12.6,	HW3
	W - 04/28	Periodic Trends: Ionic Radii, Electronegativity, etc.	OS: 6.5	
	F - 04/30	Uniqueness principle, Diagonal Effect, Inert Pair Effect		
Wk6	M - 05/03	Begin Survey of Periodic Table: Hydrogen Isotopes & Nuclear reactions	Ch24 OS: 21.1-21.3	HW4
	W - 05/05	Nuclear Radiation and Energy	Ch24, OS: 21.4-21.5	
	F - 05/07	Applications of Nuclear Chemistry	Ch24, OS: 21.4-21.5	
Wk7	M - 05/10	Oxidation-Reduction Review	Ch21, OS: 17.1-17.4	HW5
	W - 05/12	Electrochemical Cells & Nernst Equation	Ch21 OS: 17.1-17.6	
	F - 05/14	Group 1A: Alkali Metals and Redox	Ch14 OS: 17.1-17.6	
Wk8	M - 05/17	EXAM #2		HW6
	W - 05/19	Group 2A: Alkaline Earth Metals	Ch14, OS: 17.1-17.4	

	F - 05/21	Group 3A Elements	Ch14	
Wk9	M - 05/24	Group 4A Elements	Ch14	HW7
	W - 05/26	Group 5A Elements	Ch14	
	F - 05/28	Group 6A Elements	Ch14	
	M – 05/31	Memorial Day		HW8
Wk10	W - 06/2	Halogens	Ch14	
	F – 06/04	Nobel Gases	Ch14 OS: 9.1-9.4	
	06/07 – 9:00 am	Final Exam (Cumulative)		

Canvas and Class Notes:

Lectures will be online via ZOOM