Chemistry of the Elements
CHEM 2131 Section 2
Spring Quarter, 2023

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Lecture: MW 12:00 p.m. – 1:50 pm (F.W. Olin 205)

Office Hours: After each class or by appointment. Please email the instructor with your availability (times and days) for an office hour.

Required Text:

Connect Chemistry with LearnSmart and eBook - *Chemistry: The Molecular Nature of Matter and Change, 9th Edition, Silberberg, McGraw-Hill*
$110 (1 Semester) (*ISBN-13 9781260477368)*
https://www.mheducation.com/highered/product/1260477363.html

It is not mandatory to have a paper copy, but if you prefer, you have the option to purchase a pre-owned version of the 6th, 7th, or 8th edition of the Silberberg textbook, albeit you would still need a Connect Plus account.
Chemistry: The Molecular Nature of Matter and Change *- 9th Edition by* Martin Silberberg (Author), Patricia Amateis

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 acid-base chemistry, coordination chemistry, solid state chemistry, electrochemistry, nuclear chemistry, and chemical properties of main group 2A – 8A elements.

Below are the chapters we will cover are below:

- Chapter 18 – Acid-Base Chemistry
- Chapter 23 – Coordination Chemistry
- Chapter 12 – Intermolecular Forces and the Properties of Solids
- Chapter 24 – Nuclear Chemistry
- Chapter 21 – Electrochemistry
- Chapter 22 – Metallurgy
- Chapter 14 – Survey of the Periodic Table main group elements

Lectures: The lectures will generally follow selected sections of the textbook and the online text materials (see schedule). Most lectures will be presented on the board and 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.

Online Homework Set (SET)

To successfully complete your coursework, your participation in SmartBook modules and submission of problem sets will be mandatory, which will be done through an online homework platform named Connect. You can find guidelines on how to enroll in Connect on Canvas. ***Connect Homework is due every Monday at 10:59 pm***

Practice Problem Homework (PPH)

There will be selected problems throughout the quarter for you to solve and upload your solutions to Canvas. It is important that you work on these problems promptly. ***Homework is due every Monday at 10:59 pm***

Homework for the quarter is work 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 score on the final.

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 400 points**. The final exam is not optional – NO EXCEPTION. If you have to travel for a DU sports-related event, you are accountable for notifying the instructor one week prior to an impending exam.**

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

SEEKING HELP.
If you require additional assistance, the following are numerous resources available to you:

The instructor: You can either schedule an office hour by sending an email to the instructor or take advantage of the one-on-one consultation available before and after each class.

The Science and Engineering Learning center (SELC): Teaching assistants (TAs) are accessible throughout the week to address queries regarding both lecture and laboratory material. You can find the Science and Engineering Center (SELC) situated in the north-west corner of the first floor of the Anderson Academic Commons (west of the writing center). Use the link – http://portfolio.du.edu/sec to view SELC schedules. All services are free

Tutors: The Chemistry Department office has a list of graduate student tutors.

Cell Phone and Electronic Device Policy:
No use of cellphones or computers during the lecture.

Lecture and Testing Accommodations:
If you need testing accommodation, please see the University Disability Services' website at http://www.du.edu/disability/dsp/index.html. Remember you must register with the DSP ahead of time (at least a week or two) if you wish to take exams with them.

Academic Integrity:
While I advocate collaborative learning and teamwork, I also firmly believe that each individual 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'S23	Topic	Reading	Due*
		ACID-BASE		
Wk1	M - 03/27	Brønsted-Lowry and Lewis Acid-Base Theory, HSAB	18.1-18.3,18.10	
	W- 03/29	Introduction to Coordination Chemistry: Coordination, Ligands, and Structure	Ch23.1 - 2	
		COORDINATION CHEMISTRY		*Set1 PPH1*
Wk2	M - 04/03	Nomenclature of Coordination Compounds Structure and Isomerism	Ch23.3	
	W - 04/05	Structure and Isomerism Coordination Bonding Theory	Ch23.4	
		CRYSTAL FIELD THEORY		*Set2 PPH2*
Wk3	M - 04/10	Crystal Field Splitting, Spectrochemical series	Ch23	
	W - 04/12	Magnetic Properties and Absorption Spectroscopy/ Color Application of Coordination Compounds Bioinorganic Applications of Coordination Chemistry	23.4	
		INTERMOLECULAR FORCES		*Set3 PPH3*
Wk4	M - 04/17	**EXAM #1**		
	W - 04/19	Intermolecular Forces	12.1-12.3	
		SOLID STATE CHEMISTRY		*Set4 PPH4*
Wk5	M - 04/24	Properties of Solids: Ionic, Network, and Molecular crystals	12.6-12.7	
	W - 04/26	Uniqueness principle, Diagonal Effect, Inert Pair Effect		
		NUCLEAR CHEMISTRY		*Set5 PPH5*
Wk6	M - 05/01	Begin Survey of Periodic Table: Hydrogen Isotopes & Nuclear reactions	14.1, 24.1	
	W - 05/03	Nuclear Radiation and Energy Applications of Nuclear Chemistry	24.2-24.5	
		ELECTROCHEMISTRY		*Set6 PPH6*
Wk7	M - 05/08	Oxidation-Reduction Review	21.1-21.4	
	W - 05/10	Electrochemical Cells & Nernst Equation	22.3	
		PERIODIC TABLE SURVEY		*Set7*

				PPH7
Wk8	M - 05/15	**EXAM #2 (Covers Topics after exam 1)**		
	W - 05/17	Group 1A: Alkali Metal Redox Group 2A: Alkaline Earth Metals	14.2-14.4	
				Set8 *PPH8*
Wk9	M - 05/22	Group 3A Elements Group 4A Elements	14.5-14.6, 22.2	
	W - 05/24	Group 5A Elements Group 6A Elements	14.7-14.8	
		PERIODIC TABLE SURVEY		*Set9* *PPH9*
Wk10	M - 05/29	**MEMORIAL DAY HOLIDAY**		
	W - 05/31	Halogens Nobel Gases	Ch14.9 -10	
	06/05	**06/05/2023 - FINAL EXAM: 12 NOON to 1:50PM OLIN 205** (Cumulative)		*Set10* *PPH10*

06/05/2023 - FINAL EXAM: 12 NOON to 1:50PM OLIN 205 (Cumulative)

Due* - All homework are due Monday 10:59 pm