

**Instructor**                      Dr. Michael Swanson  
**Contact info:**                email: mike.swanson@du.edu  
**Class Lectures:**              TR 10:00 – 11:50, Boettcher 101

In the third quarter of 1<sup>st</sup>-year Chemistry sequence we will explore coordination chemistry, descriptive chemistry, solid-state chemistry, electrochemistry and nuclear chemistry. This course will sharpen critical thinking and develop a solid basis for future study in molecular sciences. Inorganic chemistry has far-reaching applications in many technical fields including computer science, material science and medicine.

## COURSE TOPICS

- 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

## REQUIRED COURSE ITEMS

**Textbook:**                      Connect Chemistry with LearnSmart and eBook - *Chemistry: The Molecular Nature of Matter and Change*, 9<sup>th</sup> Edition, Silberberg, McGraw-Hill  
\$110 (1 Semester) (ISBN-13 9781260477368)  
<https://www.mheducation.com/highered/product/1260477363.html>  
No paper text is required but you can buy a used copy of the 6<sup>th</sup>, 7<sup>th</sup> or 8<sup>th</sup> editions of the Silberberg text if you wish (The Connect Plus account is still required).

**Online homework:**        You will be required to participate in SmartBook modules and submit problem sets via an online homework system called Connect. Instructions for enrolling in Connect are given on Canvas.

**Calculator:**                      An inexpensive calculator that has the capabilities for square roots, logarithms, and (exponential) scientific notation operations.

**Connect address:** [https://connect.mheducation.com/class/chem2131\\_spring2023\\_swanson](https://connect.mheducation.com/class/chem2131_spring2023_swanson)

**READINGS AND SMARTBOOK ASSIGNMENTS.** Assigned reading should be completed in a timely manner. The adaptive learning software SmartBook will be used to reinforce the concepts from the book and online lectures. ***There will be a SmartBook assignment due every Thursday by 10pm*** (links on Canvas and Connect). The length and content of each assignment will vary between students depending on their understanding of the material. The more closely you read the material, the less time you are likely to spend on these assignments. SmartBook assignments (5 points each) will not be graded based on right/wrong answers but on completion. Students are strongly encouraged to spend extra time using the features in the SmartBook interface to study. **There is no way to extend the deadline for these assignments so no late work can be accepted.**

## INSTRUCTIONS ON REGISTERING FOR CONNECT:

<http://video.mhhe.com/watch/xUs68jEUwVnAB2K64eWMgc>

**RECORDED LECTURES.** Important concepts from readings will be highlighted during lectures. Periodically throughout lecture, questions will be posed and you pause the lecture and try to work through them before watching the step-by-step solutions. Recorded lectures are posted online on the Connect site and on the course YouTube channel. You can watch these lectures at a time that is convenient for you, and either before or after you complete the reading. It is highly recommended that you take careful notes, especially on any problems that are worked, during the lecture. Lecture slides are available on Canvas under the "Files" tab to use for note taking or review.

YouTube Channel: <https://www.youtube.com/channel/UCzZZ41kpx2ii8pzBXetjDKA>

**CLASS MEETINGS.** This class follows a hybridized learning model. Instead of a traditional lecture, class meetings will be used as group office hours/study hall. Questions concerning material from the reading or lectures can be asked during this time. Students can also spend this time working through homework problems and can ask questions if they run into problems. I might briefly highlight some material from the reading/lecture that I feel is important at the beginning of these meetings but, in general, I will not have any formal presentation planned. What we discuss during this time will be driven by the students. For maximum benefit, reading and/or lectures should be completed before class meeting times. Attendance at these meetings is not required. **In the event that remote learning is required at any point during the quarter, the class meeting Zoom address is:** <https://udenver.zoom.us/j/4915625194> (also found on Canvas)

**PROBLEM SETS.** Practicing problems is very helpful in the mastery of chemical concepts. Thus, problem sets will be assigned throughout the quarter using the on-line Connect system. These homework problems will be worth a total of 100 points and will be **due weekly** (by 10 pm Saturday nights). ***To allow practice after the due date, problem sets will be automatically submitted at 10 pm every Saturday. If you require an extension, you must ask before the due date!***

**EXAMS.** There will be two (2) two-hour exams given during the quarter and a two-hour, cumulative final exam. Dates for these exams are posted below on the lecture schedule. **NO MAKE-UP EXAMS WILL BE ACCEPTED.** There is one exception to this policy. If you will be out of town for a University sanctioned function (e.g., athletic team or music group), you are responsible for making arrangements with Dr. Swanson at least one week in advance to complete the exam prior to the scheduled date.

**GRADES.** Final grades will be determined according to performance on exams, problem sets and completion of LearnSmart modules. There will be a maximum of 600 points for the course:

<u>Component</u>	<u>Points</u>
Hour Exams (100 points each)	200
Final Exam	200
LearnSmart Modules (5 points each)	50
<u>Homework (10 points each)</u>	<u>100</u>
<b>Total Points</b>	<b>550</b>

**SUCCEEDING IN CHEMISTRY.** Here are few helpful hints on how to succeed in this class:


***Do your best on the exams!***

How?

1. Read the material in the text book BEFORE class. Don't get behind.
2. Follow check list of assignments (Canvas). Complete every assignment possible.
3. Attend class regularly. Take notes on content learned in lecture (Problems worked).
4. Be ready to ask questions... and ask them! Get help from course instructor!
5. Study with other students in the class.

**SEEKING HELP.** If you need help in the class, first be sure that you are following steps 1-3 listed above. If you still require assistance there are several places for you to go:

- **The instructor:** office hours are available before and after each class for one-on-one consultation. Contact the instructor via email or phone.
- **The Science and Engineering Learning center:** TAs are available throughout the week to answer questions on both lecture and lab material (See Below).
- **Peers (Study Groups):** Take opportunities to help those around you and to ask them for help. You can learn a great deal from your fellow classmates.
- **Tutors:** The Chemistry Department office has a list of graduate student tutors.

**Science and Engineering Center:** Need extra help? The Science and Engineering Center is a collaborative space staffed by undergraduate and graduate learning assistants (LAs) trained to assist students with some first and second year biology, chemistry, physics, computer science and engineering courses. We offer support for both lecture and laboratory courses for chemistry, physics, and engineering courses and lecture only for computer science and biology. 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 LAs 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. Please also follow on Twitter for the most up-to-date announcements:  **@SELCatDU**

**LECTURE AND TESTING ACCOMODATIONS.** Every effort will be made, in complete confidence, to accommodate students diagnosed with a learning disability. Any student requiring these accommodations should inform Dr. Swanson the first week of class. For further information, please see DU's Disability Services' website at <http://www.du.edu/disability/dsp/index.html>.

**ACADEMIC DISHONESTY.** Collaborative learning and teamwork are very important parts of science but cheating of any kind will not be tolerated. Each student is required to provide their own work on homework and exams. **Copying an exam or homework (as well as any behavior that could be interpreted as copying) will result in no credit being given on the assignment or exam.** Repeated offences will result in failure of the course and possible expulsion from the University. Please refer to the University's honor code: <https://www.du.edu/studentlife/studentconduct/honorcode.html>

**CLASS SCHEDULE (Assignments, Recorded Lectures, Supplemental Reading, Exams)**

Date	Topic	Reading	Assignments
<b>Week 1: LEWIS ACIDS AND BASES</b>			
3/28/2023	Course Introduction and Line Drawings	Syllabus	
3/30/2023	<b>1</b> – Acid-Base Review and Lewis Acids	18.1-18.3*,18.10	<b>SB1, Problem Set 1</b>
<b>Week 2: TRANSITION ELEMENTS AND COORDINATION COMPOUNDS</b>			
4/4/2023	<b>2</b> – Properties of Transition Elements	23.1-23.2	
4/6/2023	<b>3</b> – Coordination Compounds	23.3	<b>SB2, Problem Set 2</b>
<b>Week 3: CRYSTAL FIELD THEORY</b>			
4/11/2023	<b>4</b> – VB and Crystal Field Theories	23.4	
4/13/2023	<b>5</b> – Advanced Topics in Coordination Chem	<b>Supplement</b>	<b>SB3, Problem Set 3</b>
<b>Week 4: INTERMOLECULAR FORCES</b>			
4/18/2023	<b>EXAM 1</b> (Covers Lectures 1-5)		
4/20/2023	<b>6</b> – Intermolecular Forces	12.1-12.3	<b>SB4, Problem Set 4</b>
<b>Week 5: SOLID-STATE CHEMISTRY</b>			
4/25/2023	<b>7</b> – Solid-State Chemistry	12.6-12.7	
4/27/2023	<b>8</b> - Uniqueness principle, Diagonal Effect	<b>Supplement</b>	<b>SB5, Problem Set 5</b>
<b>Week 6: NUCLEAR CHEMISTRY</b>			
5/2/2023	<b>9</b> – Hydrogen and Intro to Nuclear Chem	14.1, 24.1	
5/4/2023	<b>10</b> – Nuclear Chemistry	24.2-24.5	<b>SB6, Problem Set 6</b>
<b>Week 7: ELECTROCHEMISTRY</b>			
5/9/2023	<b>11</b> – Electrochemical Cells	21.1-21.4	
5/11/2023	<b>12</b> – Electrochemistry cont. + Metallurgy	22.3	<b>SB7, Problem Set 7</b>
<b>Week 8: PERIODIC TABLE SURVEY: GROUPS 1A AND 2A</b>			
5/16/2023	<b>EXAM 2</b> (Covers Lectures 6-12)		
5/18/2023	<b>13</b> – Periodic Table Survey: 1A, 2A	14.2-14.4	<b>SB8, Problem Set 8</b>
<b>Week 9: PERIODIC TABLE SURVEY: GROUPS 3A, 4A, 5A AND 6A</b>			
5/23/2023	<b>14</b> – Periodic Table Survey: 3A, 4A	14.5-14.6, 22.2	
5/25/2023	<b>15</b> - Periodic Table Survey: 5A, 6A	14.7-14.8	<b>SB9, Problem Set 9</b>
<b>Week 10: PERIODIC TABLE SURVEY: GROUPS 7A AND 8A</b>			
5/30/2023	<b>16</b> - Periodic Table Survey: 7A, 8A	14.9,14.10	
6/1/2023	Open Date for Makeup Class		<b>SB10, Problem Set 10</b>

**6/6/2023**

**FINAL EXAM: 8AM to 9:50AM** (Cumulative)

\* Review Material