General Chemistry I – 2060
CHEM 1010 Section 05
Fall Quarter, 2022

Instructor: Ogar Ichire (Leo) Ph.D.

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Lecture: MWF 1:00 p.m. – 1:50 p.m. (Olin 105)

Recitation: T 1:00 p.m. – 1:50 p.m. (Olin 105)

Office Hours: Open door or by appointment. Please email for appointments.

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

Course Objective:
This course is the first half of the general chemistry sequence for chemistry and non-chemistry majors. One major objective of the course is to provide you with a good foundation of basic chemical principles that will aid your understanding of chemistry concepts in higher level science classes. These concepts would also be instrumental in advance topics in chemistry and how basic chemical principles control structure architecture, function, and application of common molecules. We will also investigate the scope and limitations of our understanding of these fundamental concepts as well. But the major focus of the course is to build your understanding of the nature of matter – its elemental composition, atomic and molecular units, atomic and molecular representation, molecular structure and functions, and reaction types - including the energy involved in reactions and the rate at which these reactions occur.
The Silberberg textbook will be our guide in exploring the nature of matter and the course will follow the general progression of the book, but we will choose chapters in a sequence that allows us to shape our understanding of concepts gradually. Also, the evolution of each chapter material and our comprehension of the course materials will be based on the Blooms Taxonomy, which can be summarized under the following cognitive levels of learning:

- **Lower Level**: learn, understand, and recall chemistry concepts.
- **Lower Medium Level**: apply the knowledge and concepts learned to solve simple problems.
- **Higher Medium Level**: draw connections between concepts – that is the ability to differentiate, organize, isolate, integrate and use the right critical thinking processes and concepts to solve composite and challenging problems.

- **High Level**: Analyze and evaluate each solved problem based on your knowledge of chemical concepts – this means understanding is key to learning and solving problems in chemistry.

Once at the High Level of cognitive reasoning, I believe you would have gained a good understanding of the basic chemical principles used by chemist and scientist to investigate various chemical systems and understand how they work. Lastly, a strong knowledge base from this course will prepare you for upper-level chemistry courses, so take learning of the course materials seriously.

In order to get the most out of this course, I advise you:

- Review the Silberberg textbook before and after each class. Preferable, read the whole chapter before class.
- Conduct searches after each class to find applications of the concepts covered in class.
- Solve as many problems as possible instead of memorizing. This means that consistent work is required and will pay off much better than cramming for an exam or throwing together an assignment at the last minute. Chemists are problem solvers. You can start by solving book problems for now.

Lectures: The lectures will generally follow the chapters of the textbook. Lectures will be presented on the whiteboard, OneNote writing software and PowerPoint slides. ***Attending every class and taking meaningful notes is incredibly important for this class.*** Keeping up with the reading will help you understand the lectures better and take more meaningful notes. Also, we will work through problems during lectures to help you understand each concept and build the necessary problem-solving skills required to excel in the class.

Problems: You should work on as many problems from the text as possible. The exams will focus on simple, applied, and composite problems – that is problems with two or more concepts. Most composite type problems require a good understanding of various concepts and your ability to connect two or more concepts together to arrive at a solution. The only way to prepare for these problems is to practice, practice, and practice. All problem types can be found in your textbook, and additional problems will be presented in class. **A good strategy may be to solve all the odd-numbered problems initially, and then the even ones as part of your exam review**. You are advised to keep a separate, dedicated notebook with all your solved problem for this course – it will make studying a lot easier and your study notes will come in handy for quick revision before exams.

Also, solving problems together in small groups can be very helpful and I encourage you to do so, especially after working through the problems yourself. Your classmates may have an alternate way of looking at a problem, and this can add to your toolbox of problem-solving skills. In addition, helping to teach the subject to other is one way to understand the concepts yourself.

Calculator: Any simple or graphing calculator would be sufficient for the calculations covered in this course. Your calculator should be capable of scientific notation, log, and exponential functions. If a graphing calculator is used, you must clear the memory before receiving the exam. On a typical TI-XX graphing calculator, the sequence is to press 2nd then '+' (MEM), then Reset, All RAM, Reset. A message will be displayed as "RAM Cleared". This must be displayed before receiving the exam. I may inspect calculators and their memory during the exams.

Exams: There will be two midterm exams each worth 100 points each and a final exam also worth 100 points – a total of 300 points. If your final exam score is higher than either midterm exam score, the lowest midterm will be dropped, and the final will replace that midterm.

Online Homework: Register with Mc Graw Hill Connect for the homework which is due Sunday night each week at 11:55 pm. The connect homework is work 100 points (25% of final grade).

Final Grade: Your final grade will be determined out of the 400 available points earned **There will be no makeup exams.** If you miss an exam for any reason, that exam will be replace by your final exam score. Also, if any midterm is lower than your final exam score, that midterm will be dropped and replace by your final exam score. Note that your midterm cannot replace your final exam score. **The final exam is not optional – NO EXCEPTION**

Homework	**25%**
Exam I	**25%**
Exam II	**25%**
Final	**25%**

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 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

DATE	TOPIC	READING	PROBLEM SETS
WEEK 1 – DIMENSIONAL ANALYSIS & INTRO TO MODELS			
Sep 12	Introduction to Models in Chemistry	1.1–1.2 & 2.3–2.5	
	Dimensional Analysis	1.3–1.4 & 3.1	Problem Set 1
WEEK 2 –QUANTUM MECHANICS & ATOMIC STRUCTURE			
19	Dual Nature of Light & Matter	7.1–7.3	
	Schrodinger Model, Quantum Numbers	7.4, 8.1	Problem Set 2
WEEK 3 – ELECTRON CONFIGURATION & PERIODIC TABLE			
26	Electron Configuration & Periodicity	8.2–8.4	
	Intro to Bonding	2.7 & 9.1–9.3	Problem Set 3
WEEK 4 – BONDING MODELS			
Oct 3	Bond Energy & Electronegativity	9.4–9.5	
	Lewis Dot Structures	10.1	
WEEK 5 – BONDING MODELS, continued			
10	Shape of Molecules (VSEPR) & Polarity	10.2–10.3	
	Valence Bond Theory & MO Theory	11.1–11.3	Problem Set 5
WEEK 6 – INTERMOLECULAR FORCES & INTRO TO CHEMICAL RXNS			
17	Intermolecular forces	12.3–12.5	
	Stoichiometry & the Mole	3.1	Problem Set 6
WEEK 7 – STOICHIOMETRY & CHEMICAL RXNs			
24	Stoichiometry, continued	3.2–3.4	
	Water as a Solvent & precipitation rxns	4.1–4.2	Problem Set 7
WEEK 8 – CHEM RXNS & INTRO TO GASES			
31	Acid Base Rxns & Redox Rxns	4.3–4.4	
	Pressure & Intro to Gas Laws	5.1–5.3	Problem Set 8
WEEK 9 – KINETICS			
Nov 7	Ideal Gas Law & Kinetic Molecular Theory	5.4–5.6	
	Thermochemistry & Enthalpy	6.1–6.3	Problem Set 9
WEEK 10 – KINETICS			
14	State Functions & Hess's Law	6.4–6.6	
	Final Review	–––	Problem Set 10

C**anvas and Class Notes:**
Lecture information will be presented on OneNote, slides and whiteboard. The slides will be posted on Canvas in addition to other useful learning materials including suggested problems and assignments.