C105 Fundamental Chemistry Syllabus & Policies for Fall 2022

(Lectures, Discussion & Lab Meetings are ALL in-person requirements)

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INSTRUCTOR'S SCHEDULE

Time	Mon	Tue	Wed	Thu	Fri
8 AM	C105-01 ***Lecture*** ***CBB 105***		C105-01 ***Lecture*** ***CBB 105***	C105 01Lab 1 **81197 in CBB 226	C105-01 ***Lecture*** ***CBB 105***
9 AM					
10 AM		C105-01 ***"Discussion"*** ***CBB 105***			
11 AM	****Office Hours***		****Office Hours***		
Noon					Committee Meetings & Seminars
1 PM					
2 PM	C105 01Lab 2 **81198 in CBB 226	C105 01Lab 3 **81199 in CBB 226	C105 01Lab 4 **81200 in CBB 226		
3 PM					
4 PM					

****Office Hours:*** *If you need help at a different time, please contact me by email to arrange either an in-person or zoom meeting.*
In-person mask Policy: You must wear a mask for individual help in my office.
Zoom meeting Policy: Your computer camera & audio must be turned on for Zoom Help meetings.

****Lab-flow enrollment codes** are **the 5-digit numbers in red** for lab sections 1-4 (that is, your lab-flow enrollment code is either 81197, 81198, 81199 or 81200).

COURSE OBJECTIVES: C105 is the 1st half of a two-semester sequence that emphasizes:

1. **The "particle" nature of matter** outlined by ***Dalton's atomic theory***, including:
   (i) Classifying & describing properties of matter.
   (ii) Writing formulas & names of simple compounds.
   (iii) Balancing common classes of reactions and solving stoichiometric equations.
   (iv) Measuring heat changes associated with chemical & physical changes.
   (v) Describing the physical behavior of ideal gases.
2. The **electronic structure of atoms** in understanding atomic trends outlined in the periodic table.
3. The **electronic structure of molecules** in understanding shapes & bond angles of simple molecules.
4. **General laboratory methods** including general safety; precision vs. accuracy of measurements; & (i) gravimetric; (ii) volumetric, & (iii) photometric methods of chemical analysis.

Objectives 1-4 satisfy the three broad GEP learning outcomes: (1) using the scientific method to explore the physical world (starting with questions/hypothesis then using experimental tests to establish laws and theories of nature); (2) using quantitative data to solve problems & make reasonable interpretations of the physical world; and (3) making relevant connections of the natural sciences to student's individual lives and society at large.

MATH PREREQUISITES: Concurrent registration in Math 107 (algebra for pre-calculus) or a suitable math placement score. **Bottom-Line:** Most of the information in **Appendix A (pages A1-A6)** of the textbook should be a review for C105 students. I encourage you to skim through the details of those pages.

ATTENDANCE POLICY: Other than laboratory & exam dates, I do not keep track of class attendance. However, you are the only person responsible for materials and information missed due to an absence from the lecture, discussion, or laboratory portions of this class.

REQUIRED MATERIALS: Please obtain the following materials as quickly as possible:

1. **Textbook** - - Chemistry: Structure & Properties (2nd edition) by Nivaldo J. Tro. Available for **RENTAL** at the University Bookstore.
2. **Electronic packet of Lab Exercises from Lab-Flow:** Available for **PURCHASE** at the University Bookstore OR directly from Lab-Flow. To enroll directly with Lab-flow, you will need the enrollment codes posted for your lab schedule on the previous page. While direct purchase from Labflow has a lower price it also has a MUCH MORE restrictive return policy than the UWSP Bookstore!
3. A **scientific calculator**. The brand/model is not important BUT you are responsible for being able to enter numbers in scientific notation & correctly perform basic calculations on those values. I prefer the Texas Instrument **TI-30** (~ 10 dollars) for the ease of interconverting numbers from decimal form to scientific notation. NOTE: Cell phones may not be used as a calculator during exams.
4. **Personal Computer and Printer:** You will need routine access to a computer/lap-top or tablet to complete the lab portion of this course.

MIDTERM EXAM SCHEDULE & POLICIES: The final mid-term exam (exam 5) is NOT a cumulative exam, it is just the last exam over the final set of C105 topics.

Exam Number	Date & time	Chapters	Point Value
Exam 1 (Week 4)	**Tuesday Sept. 27th, 2022** 10-10:55 AM in CBB 105	E, 1, 2	160
Exam 2 (Week 7)	**Tuesday Oct. 18th, 2022** 10-10:55 AM in CBB 105	2, 3, 4	160
Exam 3 (Week 10)	**Tuesday Nov. 8th, 2022** 10:30-11:45 AM in CBB 105	4, 5, 6,	160
Exam 4 (Week 13)	**Tuesday Nov. 29th, 2022** 10:30-11:45 AM in CBB 105	6, 7, 8	160
Exam 5 (Week 16)	**Tuesday Dec. 20th, 2022** 12:30-2:30 PM in CBB 105	8, 9, 10	160

- **Exam Materials:** For each exam you may use: (i) a calculator (not a cell phone); (ii) an exam information (gold) sheet that you may record notes on. I will provide a copy of the periodic table & scratch paper (as needed) for each exam.
- **Make up exams** are provided ONLY under extremely RARE circumstances. If you know that you must miss an exam, notify me as soon as possible BEFORE the exam date.
- **Replacement of lowest exam score:** The lowest score of exams 1-4 will be replaced with the average score of all four exams (this policy does not apply to exam 5 which is required to be completed by all students during finals week). Purpose: this policy ensures that one bad exam will not ruin a semester. Example: if a student is unable to attend one exam but earns an average of 75% on the other four exams (for a 4-exam average of 56%); the missed exam is scored as 56% which, in turn, increases the overall results from a non-passing average of 56% to a passing average of 70% on exams 1-4. Again, this policy is NOT extended to exam 5.

GRADING SCALE: Letter grades are assigned according to the **percentage of 1060 total points** earned. The total includes 5x 200-pt "midterm exams" for **800 points** and **260 total lab points**. The lab component is comprised of 13x 20 point assignments (accounting for about 25% of your letter grade).

Percentage	letter grade
90% & above	A
88 – 89.9 %	A minus
86 – 87.9 %	B plus
81 – 85.9 %	B
79 – 80.9 %	B minus
77 – 78.9 %	C plus
72 – 76.0 %	C
68 – 71.9 %	C minus
64 – 67.9 %	D
Below 64%	F

NOTE: I reserve the right **to SLIGHTLY lower** (**but I will never increase)** this grading scale.

ACCOMMODATIONS FOR DISABILITIES: Contact the Office of Disability Services within the first two weeks of the semester to request and arrange individual accommodations for exams. Laboratory participation, and other course assignments. Disability and Assistive Technology Center

ELECTRONIC DEVICES (i.e. PHONES) common courtesy dictates that these devices should not be used for non-class related activity (social media etc. . .) during any lecture, discussion, or lab period. Your instructor reserves the right to deduct points from your grade in instances where this activity is excessively abused. Your cell phone is not an acceptable replacement for an electronic calculator during midterm exams but I encourage you to use it as a source of information in all other course related activities (labs, problem sets etc . . .).

COVID-19 PANDEMIC GUIDELINES: Please adhere to current / up-to-date campus policies with respect to masks and social distancing.

ACADEMIC RESPONSIBILITY All cases of dishonesty (misrepresenting your work/cheating), will be dealt with in accordance to the UWSP rules on academic misconduct as stated in Chapter 14 of the Rules and Regulations Governing the Faculty, Staff, and Students of UWSP (Community Rights and Responsibilities). This document may be assessed at the UWSP web site at *http://www.uwsp.edu/centers/rights/rights.pdf*.

C105 Tentative lecture topics for Fall 2022

Materials from 11 chapters is presented over 15 weeks (~57 lecture & discussion periods). . .
Which boils down to an average of 1-chapter every 5 class meetings…
It is imperative to do your best to not fall behind!!!!!!

Week	Tentative weekly lecture topics . . . .
1	• Welcome & introduction. • Chpt 1, part 1: Daltons atomic theory, the four mass laws & the classification of matter. • Chpt 1, part 1: Chemical vs. Physical Changes
2	• Chpt. e: Significant figures & precision (vs. accuracy). • Chpt. e: Fundamental vs. Derived Properties & the factor label method of dimensional analysis. • Chpt 1, part 2: Rutherford's Nuclear model of the atom (& discovery of subatomic particles)
3	• Chpt 1, part 2: Mass spectroscopy, isotopes & average atomic mass calculations • Chpt 1, part 2: The mole-concept & mole-weights of simple compounds. • Chpt 2: The electromagnetic spectrum & wave vs. particle properties of light
4 (Ex 1)	• Chpt 2: The Bohr model of hydrogen atoms. • Chpt 2: The Schrodinger model of hydrogen atoms.
5	• Chpt 3: The Periodic Table: metals, non-metals, semimetals & main group elements. • Chpt 3: The Ground state electron configurations of multielectron atoms. • Chpt 3: Periodic trends of atomic properties (radius, ionization energy, electron affinity, etc)
6	• Chpt 4: The octet rule of forming ionic or covalent bonds & normal valency rules. • Chpt 4: Formal naming rules of binary molecules and simple ionic compounds • Chpt 4: Using weight percent data to determine empirical formulas of compounds
7 (Ex 2)	• Chpt 5: Using the octet rule to write Lewis Structures of simple molecules • Chpt 5: Formal charge, exceptions to the octet rule, resonance structures • Chpt 5: Apply VSEPR theory to predict molecular shapes and bond angles
8	• Chpt 5: Molecular polarity. • Wrap up Chpt 5 Material.
9	• Chpt 6: Valence bond theory: sigma bonds vs. pi bonds. • Chpt 6: Correlation of bond number and length with bond strength. • Chpt 6: Hybridization of atomic orbitals around central atoms.
10 (Ex 3)	• Chpt 7: Balancing chemical equations. • Chpt 7: Theoretical yields of products and minimum mass of reactants. • Chpt 7: Percent yields, limiting vs. excess reactants.
11	• Chpt 8: Preparing stock solutions of defined volume and molarity & making dilutions. • Chpt 8: Conductivity test comparing non-electrolytes to strong and weak electrolytes. • Chpt 8: Precipitation reactions: total vs. net ionic equations and spectator ions.
12	• Chpt 8: Solubility rules and predicting if a precipitation reaction occurs. • Chpt 8*: Acid-Base Neutralization reactions. • Chpt 8*: Naming binary acids and oxy acids.
13 (Ex 4)	• Chpt 8*: Oxidation-reduction (Redox) reactions. • Chpt 9: The first law of thermodynamics, energy units & state functions.
14	• Chpt 9: Measuring the heat change of a balanced reaction (ΔH) by calorimetry. • Chpt 9: Hess's Law of Heat Summation: calculating the heat change of a reaction. • Chpt 9: Using bond dissociation energies (D) to calculate the heat change of a reaction.
15	• Chpt 10: KMT of Ideal Gas Behavior & the ideal gas law. • Chpt 10: The combined gas law & Dalton's law of partial pressure for gas mixtures. • Chpt 10: Effect of particle mass and temperature on the Boltzmann distribution of particle velocity. ✓ That's it folks (whew) . . . CONGRATULATIONS !!!!!!!

Exam 5: Chapters 8, 9, and 10
Week 16 Tuesday December 20, 2022 from 12:30-2:30 PM