Department of Natural Sciences
24-114-50: General Chemistry I, 3 credit hours (Dual Credit Section)
Academic Year: 2021-2022

Instructor: Mrs. Jennifer Reed **Email:** jreed@nwmissouri.edu

Office Hours: Virtual Office Hours MTWRF: 2:45-3:10 pm Other appointments – face-to-face and via Zoom conferencing – available upon request. Available through email 8:00 am – 4:15 pm weekdays.
Additional Dual Credit Zoom Office Hours will be posted in the 'Getting Started' section on Northwest Online

Prerequisites:
Prerequisite: High School Algebra.
Note that you must receive grade of "C" or higher in 24-114 in order to take 24-116 (General Chemistry II)

Textbook and/or Supplementary Materials:
Textbook: Chemistry; 10th Ed.; Zumdahl, Zumdahl, and Decoste.
Supplemental Material: You will need a scientific calculator capable of exponential notation; a graphing calculator is not necessary. In some cases, supplemental handouts may be provided to support understanding of material covered. The following supplemental material will be provided through NW online:

- Powerpoint slides presented in class will be posted.
- Study guides for each chapter will be posted so students are aware of the material for which they are responsible.
- Practice exams will be posted to help students prepare for exams.

Course Description:
General Chemistry I is a beginning course for science majors with a good high school background in chemistry. *This course must be taken concurrently with Chem 24-115*. This course covers fundamental chemical principles such as atoms, molecules, chemical reactions, stoichiometry, and gas laws as it progresses towards a detailed study of quantum chemistry, periodic relationships, and molecular structure and properties. Three hours of lecture and recitation per week.

Student Learning Outcomes	Assessment Methods
Communication: The student will use visuals, non-alphabetic text, and non-verbal components successfully within spoken and written texts.	Homework, Quizzes, and Exams
Critical thinking: The student will assimilate, retain, and interpret information.	Homework, Quizzes, and Exams
Critical thinking: The student will produce original expression of ideas.	Homework, Quizzes, and Exams
Critical thinking: The student will elucidate solutions based on conclusions with the ability to self-evaluate their effectiveness.	Homework, Quizzes, and Exams
Critical thinking: The student will recognize that the process is self-reflective and continuous.	Homework, Quizzes, and Exams
Course outcome: The student will learn to develop and use models (conceptual, physical, and mathematical) to understand chemistry.	Homework, Quizzes, and Exams
Course outcome: The student will learn to analyze information in a logical manner and use mathematical models to solve chemical problems.	Homework, Quizzes, and Exams

Course outcome: The student will master basic knowledge of chemistry and use this knowledge to develop an understanding of the historical and modern relationship between chemistry and society.	Homework, Quizzes, and Exams

Course Requirements:

Grades will be based on the following areas: Exams, Homework, and Quizzes. The contributions from each to the final course grade are shown below.

Discussions – 20 (10 pts each)	200 points
Integrated Problems –10 (10 pts each)	100 points
Hour Exams (100 pts x 4 Exams)	400 points
Final Exam	100 points
Homework Worksheets	360 points
Quizzes	100 points
Total	**1260 points**

Grading Scale:
Your course letter grade will be guaranteed using the percent criteria listed below.

A	90 – 100%
B	80 – 89%
C	70-79%
D	60-69%
F	Below 60%

Instructional Methods and Techniques:
This class will be administered online within your high school classroom. You will work through the modules under the schedule provided in this document. If you feel like you need more time, please communicate with Mrs. Reed. The modules will contain lecture material and practice problems. Students are expected to use their calculators and work through practice problems on their own.

Quizzes and exams are multiple-choice and found on Northwest Online. **Quizzes and exams will be taken in the classroom under the supervision of a high school instructor/counselor unless otherwise arranged.** A code will be required to access all quizzes and exams. Quizzes and exams are timed. You will be allowed only one attempt at each quiz and exam.

Discussion prompts will be delivered through Northwest Online. Students are expected to respond to the prompt with at least three complete sentences (unless otherwise noted) and use proper net etiquette. A document outlining proper net etiquette can be found on the Northwest Online site. Discussion grades will be based on these guidelines and whether the student addressed the prompt correctly and completely.

Integrated Problems are a chance to use the knowledge gained from the module to solve a more complex, multi-step problem. You will be required to work the integrated problems out on paper and submit to Northwest Online as a pdf document or a Word document with embedded images of your work. Integrated Problems may be worked on with other students in the class; however, each student will submit a document. The document must include a statement acknowledging all of the 'authors'.

The Homework Worksheets are an avenue for you to practice the chemistry concepts that you have learned.

ALL ASSIGNMENTS, QUIZZES, AND EXAMS MUST BE COMPLETED AND SUBMITTED BY THE DUE DATE. LATE WORK WILL RECEIVE A ZERO.

Chemistry is unique in that it builds upon itself, it requires application of knowledge to many different types of problems, and simply memorizing material is not sufficient to do well in the course. In order to be successful in this introductory course, students are expected to devote 2-3 hours studying outside of class for every 50 minutes spent in class. Time outside of class should be used to read the sections in the text book to aid in the review and clarification of notes taken during class and reinforce concepts. Of critical importance is the completion of homework problems

assigned. If students are having difficulty with math problems or work very slowly, they should work more problems than the minimum assigned. Given that chemistry builds on itself, it is highly recommended that students utilize their high school instructors and myself (through email or Zoom conferencing) with questions as they arise and prior to presentation of the next topic in class.

Course Outline/Major Topics Studied:

Modules	Sections Covered	Topics	Assignments
1	1.1, 1.2, 1.5-1.9	• Introductions, Syllabus, Keys to Success • Classifying Matter (Pure Substances, Mixtures, Elements and Compounds) • Atomic Scale and Representation/ Symbolism, Physical/Chemical Properties and States of Matter • Scientific Method, Making Measurements (SI Units) • Making Measurements (Uncertainty, Significant Figures, Accuracy/Precision) • Unit Conversions and Dimensional Analysis	Discussion #1 Discussion #2 Discussion #3 Integrated Problem #1 Integrated Problem #2 Quiz #1 -- Syllabus Quiz #2 Homework Worksheet (15 pts)
Module 1 Assignments - Due by September 17, 2021			
2	2.1 – 2.6	• Atomic Structure, Atomic and Mass Numbers, Isotopes • Periodic Table, Compound Formation (Molecular and Ionic Compounds) • Naming Compounds and Writing Formulas	Discussion #4 Discussion #5 Integrated Problem #3 Quiz #3 Homework Worksheets (15 pts)
Module 2 Assignments/EXAM #1 – Due by October 15, 2021			
3	3.1 – 3.7, 3.9	• The Mole (Avogadro's Number, Relating moles to number of particles) • The Mole (Molar Mass, Molecular Masses and Formula Masses, Interconversions – Grams, Moles, and Molecules) • Chemical Reactions and Stoichiometry, Balancing Chemical Equations/Mole Ratios • Stoichiometric Calculations • Determining Empirical and Molecular Formulas • Limiting Reactants and Percent Yields	Discussion #6 Discussion #7 Discussion #8 Integrated Problem #4 Quiz #4 Quiz #5 Homework Worksheets (20 pts)
Module 3 Assignments/EXAM #2 – Due by December 10, 2021			
4	4.1 – 4.3, 4.5, 4.7, 4.9	• Solution Chemistry – Concentration Units and Preparation of Solutions of Known Molarity • Chemical Reactions: Acid and Base Rxns and Net Ionic Equations • Chemical Reactions: Precipitation Rxns • Chemical Reactions: Oxidation-Reduction Rxns • Stoichiometry – Quantitating Reactions in Aqueous Solution	Discussion #9 Discussion #10 Integrated Problem #5 Quiz #6 Homework Worksheets (15 pts)
Module 4 Assignments – Due by January 28, 2022			
5	6.1 – 6.8	• Properties of Gases and Pressures • Gas Laws and the Ideal Gas Law • Quantities of Gases in Chemical Rxns, Gas Density/Molar Mass	Discussion #11 Discussion #12 Discussion #13 Integrated Problem #6 Integrated Problem #7 Quiz #7

		• Gas Mixtures/Partial Pressures, Kinetic Molecular Theory of Gases (Molecular Speeds, Effusion, Diffusion)	Homework Worksheets (15 pts)
Module 5 Assignments/EXAM #3 – Due by February 18, 2022			
6	7.1 – 7.12	• Properties of Electromagnetic Radiation, Planck's Theory • Bohr Model, Quantum Mechanical Model of the Atom • Quantum Numbers, Atomic Orbitals Size and Shape • Atom and Ion Electron Configurations • Periodic Trends (Sizes, Ionization Energies, Electron Affinities)	Discussion #14 Discussion #15 Discussion #16 Integrated Problem #8 Quiz #8 Homework Worksheets (10 pts)
Module 6 Assignments – Due by March 25, 2022			
7	8.1 - 8.3, 8.6-8.8, 9.1-9.3	• Types of Chemical Bonds, Lewis Symbols, Octet Rule, Lewis Structures • Multiple Covalent Bonds/Lewis Structures • Bond Polarity/Electronegativity, Formal Charge, Exceptions to the Octet Rule • Covalent Bonds: Length, Strength, and Energy • Molecular Shape, VSEPR Theory • VSEPR and Molecular Geometries • Bond and Molecular Polarity	Discussion #17 Discussion #18 Discussion #19 Integrated Problem #9 Integrated Problem #10 Quiz #9 Homework Worksheets (10 pts)
Module 7 Assignments/EXAM #4 – Due April 22, 2022			
8		• Cumulative Review for Exam	Discussion #20 Quiz #10
FINAL EXAM (Cumulative plus Module 8) – Due April 29, 2022			

Disclaimer: Course schedule is subject to change and you will be responsible for abiding by any such changes. Your instructor will notify you of any changes.

Classroom Behavior
As this is an online, dual credit course, you are required to abide by the behavior instructions outlined by your high school instructor. Communication with your university instructor is strongly encouraged. All communications in this course should be professional and courteous.

Attendance Policy:
There is a strong correlation between attendance and success in this class. In an on-line course, time spent working on the material presented in the modules reflects how engaged a student is with the course.

Make-Up Exams
Make-up exams will only be given to students in situations where there is an extreme emergency, such as a family funeral (supportive documentation required) or illness. The university instructor must be notified PRIOR to the exam if a student is unable to take exam at the scheduled time. The high school instructor will communicate with the university instructor to arrange a make-up exam. *The make-up exam may not be the same format as the exam given during the regularly-scheduled time.*

University Communications:
Students are expected to use their Northwest student email account for any electronic correspondence within the university. Students are also strongly advised to check their email and CatPAWS accounts on a regular basis.

Academic Integrity Policy: The students, faculty, and staff at Northwest endeavor to sustain an environment that values honesty in academic work, that acknowledges the authorized aid provided by and intellectual contributions of

others, and that enables equitable student evaluation. Please refer to Northwest Missouri State University's Academic Integrity Policy at http://www.nwmissouri.edu/policies/academics/Academic-Integrity.pdf

Learning or Living Accommodations Request Process: Northwest Missouri State University complies with Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990 [ADA] and the ADA Amendments Act of 2008 [ADAAA]. If a student has a documented disability that qualifies under the ADA/ADAAA and requests accommodations, they should review the Accessibility and Accommodations webpage at https://www.nwmissouri.edu/titleixequity/accessibility/index.htm for guidance, including the accommodations application and supporting documentation requirements. Contact ada@nwmissouri.edu or 660.562.1873 for further assistance. For the university policy on disability accommodation refer to http://www.nwmissouri.edu/policies/student/Disability-Accommodation.pdf

Non-discrimination and anti-harassment policy: Northwest Missouri State University is committed to maintaining an environment for all faculty, staff, students, and third parties that is free of illegal discrimination and harassment. Please refer to the Non-Discrimination and Anti-Harassment Policy at http://www.nwmissouri.edu/diversity/titlevi.htm

Family Education Rights and Privacy Act (FERPA) policy: Family Educational Rights and Privacy Act of 1974, as amended (commonly known as the Buckley Amendment), is a federal law which provides that colleges and universities will maintain the confidentiality of student education records. Please refer to the Family Educational Rights and Privacy Act (FERPA) Policy at http://www.nwmissouri.edu/policies/academics/Family-Educational-Rights-and-Privacy-Act.pdf

COVID-19 Classroom Mitigation: Northwest is committed to the health and safety of the University community. Face coverings are required in all instructional spaces (classrooms/labs/studios) for all students and faculty until campus vaccination and infection data allow the university to direct otherwise. Should a non-vaccinated faculty member or student make close contact with a symptomatic, COVID-19 positive student, they will be asked to quarantine and not enter University facilities (unless otherwise instructed by University Wellness) or attend class until that quarantine period is over. Faculty will provide means for students missing class because of COVID-19 quarantine or isolation to keep up with course work, but students must communicate with faculty and adhere to the quarantine/isolation start and end dates. All other illnesses or absences for personal reasons will be handled as they were before the pandemic. Northwest further asks all students and faculty to practice good hygiene and not enter University facilities or attend face-to-face classes when they feel sick. Students who do not comply with these requirements will be subject to standard disciplinary procedures according to the Northwest Student Code of Conduct (i.e. verbal and written warnings followed by a hearing, if necessary). We thank you for doing your part to maintain our learning environment and to protect the health of fellow Bearcats.

Change in Course Delivery:
It is our goal as a University to continue all courses as planned on campus. However, due to unforeseeable impacts of COVID-19 and its variants, faculty and students must be prepared to adjust course formats or mitigation strategies anytime during the semester, either permanently or for a short term. The University and faculty will communicate with students in the event such action is deemed necessary to preserve the health and safety of students and employees.

Quarantine checklist:
YOUR to do List:

☐ Call 911 if you experience difficulty breathing or a change in your level of consciousness.

☐ Contact Wellness Services at 660.215.8573 with questions. You may text or call between 7 a.m. and 7 p.m. If you have an emergency outside of these hours, contact UPD at 660.562.1254.

☐ Notify all of your instructors of your absence and predicted date of return. They will assist you in your coursework by providing information on their strategies for distance learning. Please ensure that you have your laptop, notes, textbooks, and other necessary course materials when you enter into quarantine. Lack of engagement in your coursework during quarantine will likely result in lower grades or failure. When communicating with your instructors, you may provide them with the reason you cannot be in the classroom, but you are not required to do so.

☐ Stay away from all people.

☐ You must talk with a Wellness Services staff member every few days, either by phone, text, Zoom or Skype. If you develop COVID-19 symptoms, you MUST notify Wellness Services immediately. It is important for your wellbeing that

Northwest maintains contact with you. We want to know you are doing okay, answer any questions you have, check for symptoms and assist with your needs.

Behavior and Wellness: *[Recommended]* Northwest focuses on student success—every student, every day.
The Wellness Center, 660.562.1348, offers free counseling for students coping with depression, anxiety, alcohol or drug misuse, relationships, and other emotional, social, and academic stressors. In addition, faculty, staff, and students who are concerned with student wellbeing can report their concerns, including anonymously, to the Behavioral Intervention Team, so that the student can be offered relevant support, at this link: Concerning Behavior Reporting Form. If you are concerned about the immediate safety of a student, please call the University Police, who have specialized training in intervention, at 660.562.1254.