Chemistry 106 - Fundamental Chemistry
Spring 2018
Dr. Erin D. Speetzen

Contact Information

Office: B-135 (Science)
Phone: 715-346-3258 (office)
E-mail: erin.speetzen@uwsp.edu

Office Hours –

Mondays 11:00 a.m. – 12:00 p.m.
Tuesdays 11:00 a.m. – 12:00 p.m.
Wednesdays 3:00 p.m. – 4:00 p.m.
Thursdays 12:00 p.m. – 1:00 p.m.
You can also email to set up an appointment

The best way to reach me is via my university email. I check my email periodically throughout the workday. I do not check email at night or during the weekend.

Meeting Times

Lecture: Monday, Tuesday, Thursday 2 – 2:50 p.m. SCI A121.

Lab/Discussion:

Section Number	Discussion (Room)	Lab (Room)	Lab Instructor
01	W 10 – 10:50 (A110)	T 8:00 – 10:50 (B140)	Arin Lemke
02	W 11 – 11:50 (A110)	R 8:00 – 10:50 (B140)	Arin Lemke
03	W 12 – 12:50 (A110)	F 8:00 – 10:50 (B140)	Arin Lemke
04	W 2 – 2:50 (A110)	F 1:00 – 1:50 (B140)	Erin Speetzen

Prerequisites

Chem 105, Math 100 or higher

Required Materials

Textbook

Chemistry – an Atoms-Focused Approach Gilbert, Kirss, and Foster, 1st Edition, Norton, *2014*. This book is available for rental at the University Bookstore.

Lab Manual

Chem. 106 Lab Manual – Spring 2018, UW-Stevens Point. This lab manual is available for purchase at the University Bookstore.

Lab Notebook carbonless lab notebook. This is available for purchase in the bookstore, next to the lab manuals. If you have one from Chem 105 last fall you do not need to purchase a new one.

Scientific Calculator

Your calculator must be able to do logarithms. You will not be allowed graphing calculators or any calculator with a QWERTY or alphabetical keyboard. Calculators that meet these requirements can be purchased at the University Bookstore, office supply stores such as Staples or Office Depot, or at other stores such as Target, Walmart, etc. for around $10.

Optional Materials

3-Ring Binder

In order to better keep track of course materials, some students may find that using a 3-ring binder is beneficial as it allows you to more easily incorporate handouts or figures into your notes.

Course Description

Fundamental principles and theories of chemistry, including stoichiometry, atomic and molecular structure and bonding, nuclear chemistry, thermodynamics, descriptive chemistry of nonmetals and transition metals, chemical kinetics and equilibria, introduction to organic chemistry. A continuation of Chemistry 105.

Course Learning Outcomes

1. Be able to use qualitative and quantitative skills to solve chemistry problems.
2. Be able to use the theories of chemistry to explain chemical and/or physical phenomena.
3. Be able to organize and present data in such a way as to draw reasonable and defendable conclusions.
4. Be able to demonstrate appropriate and safe laboratory procedures within the chemistry lab.

This Course Meets the Following General Education Learning Outcomes

1. Identify the basic taxonomy and principles of the scientific method as it pertains to the natural, physical world.
2. Infer relationships, make predictions and solve problems based on an analysis of evidence or scientific information.
3. Apply scientific concepts, quantitative techniques and methods to solving problems and making decisions.
4. Describe the relevance of some aspect of the natural sciences to your lives and society.

Classroom procedures

This course consists of a lecture, discussion, and laboratory. Time spent during lecture may be used in a variety of ways including lecture, small and large group discussion, and group activities. Discussion will be devoted to smaller group discussions/activities aimed to improve your understanding of the material, as well as time for you to ask questions about things that you are struggling with or things that you are interested in. The laboratory period will be used to build and assess your skills in the laboratory.

Preparation/Participation

Before coming to class each day, you should review your notes from the previous day. Most days at the start of class there will be a problem posted for you to work on at the start of class that draws on knowledge from previous material.

During class I expect that you pay attention (to the best of your abilities), refrain from using technology (iPod, laptops, cell-phones, etc.) in a disruptive way, and participate in class discussions and activities. Participation is not awarded its own grade, but in my experience students who participate in class tend to do better than those who do not.

Recommended study habits and tips

Chemistry is not an easy subject to master, and you should not expect to master it without hard work and time. The best way to break this time up is to break your studying up into small, manageable chunks that you work on each day. Chemistry can become incredibly overwhelming if you wait until the night before the exam to start studying.

Here are some study habits and tips that may be useful.

- When taking notes in class leave a lot of white space so that you can go back and fill in gaps later. After class, sit down with a friend or the text book and fill in the things you are missing. When you are done read through your notes and see if they make sense. If not, talk to a friend, reread sections of the book, or talk to the professor to keep filling in the gaps until things make sense.
- Make sure you're looking at the study guides and using them as you study. Do you understand what the key skills are asking you do to? Can you answer the big questions? Do you know what the symbols in the equations mean? Do you know when to use which equation? If the answers to these questions are no, the exam will go poorly.

- Do as many problems as possible! On exams, I won't be asking you how you feel about chemistry, I'll be asking you to answer/solve chemistry problems. In order to do that you need to know how to answer/solve chemistry problems. The best way to learn this, or any other skill, is practice, practice, and more practice!

Grading

Laboratory component:	130 pts
Lecture component:	
Discussion quizzes	50 pts
4 50-minute exams @ 70 pts each	280 pts
Final Exam	140 pts
Total Lecture Points	470 pts

Total Points in Course: 600 pts

Your grade in the course will be determined using the following scale

Letter Grade	Minimum % Needed	Minimum Points Needed	Letter Grade	Minimum % Needed	Minimum Points Needed
A	93	558	C+	77	462
A-	90	540	C	73	438
B+	87	522	C-	70	420
B	83	498	D+	67	402
B-	80	480	D	63	378

Students earning less than 378 points will earn a grade of F in the course.

Discussion quizzes – Each week in discussion, students will take a 5-point quiz. Your 10 highest scores will count towards your grade in the course.

50-minute exams – Four 50-minute exams will be given during the semester. These exams will occur during the normal class period. They may include multiple-choice, matching, short answer, essay, and/or worked problems.

Final Exam – One two-hour cumulative final exam will be given at the end of the semester.

Exam make-ups will only be allowed for emergencies (illness, death in the family, etc.) and/or school sponsored events and only with proper documentation. Not feeling prepared for the exam is not grounds for a make-up.

Lab Reports – You will be completing 13 lab activities during the semester. Twelve labs are worth 10 points, one is worth 20 points. ***I will drop your lowest 10-point lab score.***

Rights and Responsibilities

UWSP values a safe, honest, respectful, and inviting learning environment. In order to ensure that each student has the opportunity to success, we have developed a set of expectations for all students and instructors. This set of expectations is known as the *Rights and Responsibilities* document (http://www.uwsp.edu/dos/Documents/CommunityRights.pdf) and it is intended to help establish a positive living and learning environment at UWSP.

Academic Misconduct

The definition of academic misconduct can be found starting on page 11 of the Community Right and Responsibilities document found at

http://www.uwsp.edu/dos/Documents/CommunityRights.pdf

Students found to have engaged in academic misconduct on homework or labs will receive a score of zero on the assignment for the first offense and an F in the course for the second offense. Students found to have engaged in academic misconduct on an exam will receive a grade of F for the course.

Disability Services

The Americans with Disabilities Act (ADA) is a federal law requiring educational institutions to provide reasonable accommodations for students with disabilities. If you have a disability and require classroom or exam accommodation, please register with the Disabilities Services offer and then contact me.
In order to receive accommodations, you must have documentation of your disability on file with the Office of Disability Services. In addition, you must provide me with an Accommodations Request Form (available at the website). You must have me sign the form and return it to the Office of Disability Services.

Important Dates

Jan. 22	Classes Begin
Jan. 31	Last day to drop a 16-week course without a grade
Mar. 23	Spring break begins at 6 p.m.
Apr. 2	Classes resume
Apr. 6	Last day to drop a 16-week course.
May 11	Last day of class

Tentative Lecture Schedule

The instructor reserves the right to change this schedule as needed. Changes will be announced in advance via an in-class announcement. If you are not in class be sure to talk to your classmates about any missed announcements.

Week	Lecture	Topic
1	1	Syllabus, course intro, 105 review
	2	Kinetic molecular theory of gases (Ch10)
	3	Gas laws (Ch. 10)
2	4	Mixtures of gases (Ch. 10)
	5	Gases and stoichiometry (Ch. 10)
	6	Enthalpy and solution (Ch. 11)
3	7	Vapor pressure (Ch. 11)
	8	Colligative properties, part 1 (Ch. 11)
	9	Colligative properties, part 2 (Ch. 11)
4	10	Spontaneity and entropy (Ch. 12)
	11	Absolute entropies (Ch. 12)
	12	**Exam 1 – Lectures 1 – 11**
5	13	Delta G and spontaneity (Ch. 12)
	14	Temperature dependence on spontaneity and coupled reactions (Ch. 12)
	15	Rate of Reaction (Ch. 13)
6	16	Differential rate laws (Ch. 13)
	17	Determining rate laws (Ch. 13)
	18	Integrated rate laws - equations (Ch. 13)
7	19	Integrated rate laws – graphs (Ch. 13)
	20	Collision Theory (Ch. 13)
	21	Changing reaction rates (Ch. 13)
8	22	Reaction mechanisms (Ch. 13)
	23	Reversibility and Equilibrium (Ch. 14)
	24	**Exam 2 – Lectures 12 – 23**
9	25	Writing expressions for and magnitudes of K (Ch. 14)
	26	Finding Kc and Kp (Ch. 14)
	27	Calculations involving K (Ch. 14)
Spring Break – No Classes		
10	28	LeChatlier's principle (Ch. 14)
	29	K and Delta G (Ch. 14)
	30	pH, pOH, strong acids and bases (Ch. 15)
11	31	Conjugate acid-base pairs, Ka, Kb, pKa, pKb (Ch. 15)
	32	Weak acid/base calculations
	33	**Exam 3 – Lectures 25 – 32**
12	34	Titrations – part 1 (Ch. 15)
	35	Titrations – part 2 (Ch. 15)
	36	Salt solutions and intro to buffers (Ch. 15)
13	37	Buffer calculations (Ch. 15)
	38	Solubility (Ch. 15)
	39	Redox reactions and half reactions (Ch. 17)
14	40	Electrochemical cells (Ch. 17)
	41	E, Delta G, and K (Ch. 17)
	42	**Exam 4 – lectures 35 – 41**
15	43	Balancing nuclear equations (Ch. 20)
	44	Energy changes for nuclear reactions (Ch. 20)
	45	Applications of nuclear chemistry (Ch. 20)
16		Final Exam: Thursday, May 17th 8:00 a.m. – 10:00 a.m.