



Welcome to Fundamental Chemistry!

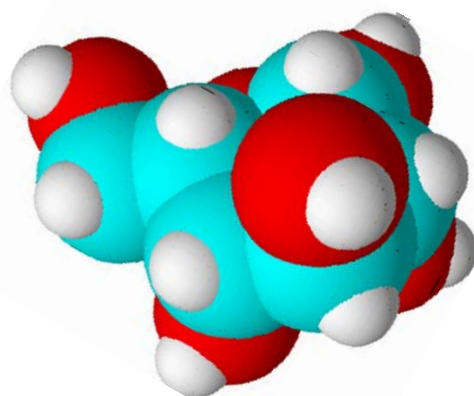
CHEM 105 - Honors, Fall 2018

Lecture/Discussion:

M, W, Th, F 1:00 – 1:50 PM. CBB 265

Laboratory:

Friday, 8:00 – 10:50, CBB 220



Dr. Dave Snyder
dave.snyder@uwsp.edu

Office Location: CBB 445

Office Hours: TBD

715-346-2155

Please come and see me or contact me with your questions or concerns!

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About the Instructor



My name is Dr. Dave Snyder, and I'm excited about the opportunity to work with you this fall. I teach courses in general and analytical chemistry here at UWSP (CHEM 100, 105, 106, 248, and 446) and conduct air pollution-related research with a small group of students each semester. I love teaching and interacting with my students, and I hope that you will enjoy being in my class. This course will be challenging, but please be assured that I will be there to support you and guide you along the way.

What is this course all about?

Chemistry 105 and 106 together provide a broad introduction to the field of chemistry. In Chemistry 105, we focus on modern atomic and molecular theory. We will study the structure of matter, from the subatomic particles that make up atoms to the formation and structure of simple molecules and ionic compounds that can be readily studied in the laboratory. You will study how molecules interact with one another and work to understand the interaction between matter and energy. Finally, you will learn how chemists describe chemical and physical changes and learn how to predict the results of chemical and physical interactions in both descriptive and mathematical terms. Chemistry 105 provides the foundation for Chemistry 106, which focuses in more detail on the nature of chemical interactions.

Words of Advice

1. Don't spend too much time thinking and worrying about your grade

Your number one task as a student should be to learn, not to get a good grade. Many students are solely focused on earning a good grade and have been taught to equate high marks with learning. My experience has been that students who get good marks are not always learning in ways that are meaningful and help them to be successful in advanced courses and in their careers. In other words, if you focus your efforts on learning, good grades tend to follow; however, if you focus your efforts on getting a good grade, effective learning does not necessarily follow.

2. Strive for understanding. You cannot memorize your way through this class.

Memorization is a type of learning that is often necessary but very low on the taxonomy of learning. In this class, you will be required to memorize some material so that you can speak the language of chemistry and quickly recognize and name elements, compounds, and particles; however, reliance on brute-force memorization (often what students tend to do right before an exam) tends to be impermanent. A true understanding of chemistry cannot be achieved through memorization, so strive to achieve a conceptual understanding of chemistry. Note that the learning outcomes for this class listed on the next page do not include memorization but require you to, among other things, *describe*, *perform*, and *demonstrate*. Primarily, you will be evaluated this semester on your ability to meet these learning outcomes.

Learning Outcomes

After successful completion of this course, you should be able to

- Describe how the chemical and physical properties of matter arise from the fundamental properties of atoms, molecules, and ions
- Accurately perform fundamental chemical calculations including balancing chemical equations, converting between mass and moles, determining theoretical yields, calculating concentrations, and converting between concentrations and the amount of a solute in a solution
- Quantitatively and qualitatively describe the flow of energy that takes place during chemical reactions and physical changes
- Demonstrate proficiency in making measurements and performing experiments in the chemical laboratory
- Record data and report & interpret the results of laboratory experiments with appropriate levels of precision

Inclusive Excellence

I recognize that students in my classroom may have diverse racial, ethnic, cultural, and religious backgrounds, sexual orientations and gender identities. I further recognized that students in my classroom may face unique challenges due to health conditions, family obligations, current or past military service, and other situations that may result in significant obstacles to learning.

I am committed to providing a civil, respectful, and equitable classroom where all my students have the opportunity to succeed and feel safe and valued. I believe diversity should be celebrated and embraced because it helps to create an optimal environment for shared inquiry and the development of sophisticated graduates who recognize the value of diversity and human dignity.

I welcome your suggestions and ideas on how we can create and maintain an inclusive and equitable learning environment during the semester.

Course Format

Lecture/Discussion

Lecture/discussion periods will be an interactive mix of discussion, problem solving, and presentation of concepts and examples. I expect you to be an *active* participant in class discussions and activities. I employ many different learning strategies that are research-based and have been shown to improve student learning, but no strategy works unless you are a willing and engaged participant! You are responsible for all material presented during lecture and discussion periods and should take careful notes. As is customary in university courses, not all material will be covered in class, so be sure to complete all assigned reading activities and homework assignments. If anything is unclear to you, please

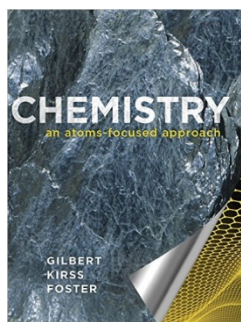
come and see me. My role in this course is to facilitate your learning experience, and my favorite part of being a professor is meeting with you, whether it is in the classroom, lab, my office, or walking down the hallway or sidewalk. Don't ever think that you are bothering me when you come to see me – you are the reason why I am here.

Laboratory

Lab periods will provide you with the opportunity to make observations, engage in scientific reasoning, interact directly with natural phenomena, use scientific tools, and learn to record, analyze, and report scientific data and results. Getting the most out of lab requires that you be punctual, attentive, and curious. It is also critical that you come to lab prepared, so please read lab procedures thoroughly before attending lab.

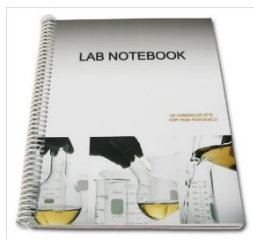
Learning Resources and Required Materials

Textbook



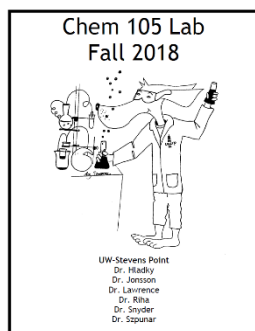
Chemistry: An Atoms Focused Approach, by Gilbert, Kirss, and Foster
Available through text rental at the University Store

Lab Notebook



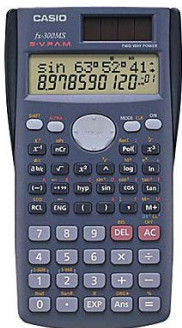
You will need a laboratory notebook with carbonless duplicate pages such the one shown here that is available for purchase at *the University Store*.

Lab Manual



CHEM 105 Lab Manual, Fall 2018, by UWSP Dept. of Chemistry
Available for purchase at the University Store.

Scientific Calculator



You will need a scientific calculator with log functions. It does not have to be a fancy, expensive one. My trusty Casio fx-300 ES solar (shown at left) costs \$11.49 at Staples, got me through college and graduate school, and never needs new batteries!

Lab Goggles



Lab goggles (not glasses) are required for all laboratory experiments and are available for sale at The University Store/ Text Rental. If you are planning on taking many lab courses, purchasing in a pair of quality goggles will be a good investment. The Student Chapter of the ACS will have goggles for sale sometime during the semester.

A Stapler



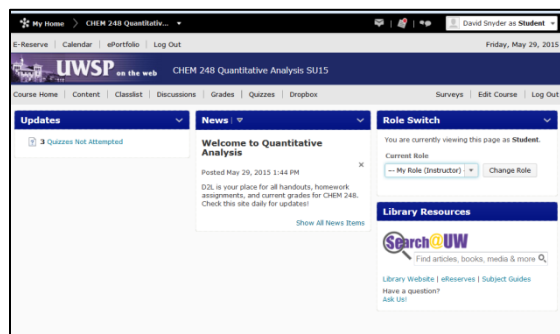
Please by a stapler! 1 point will be deducted from each lab report or homework assignment that is not stapled (note: I do mean stapled – not dog-eared, paper-clipped, or fastened with anything other than a staple). Do not rely on the instructor to have a stapler available for you to use.

Time



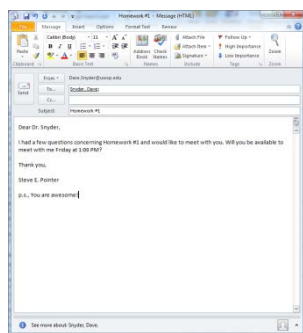
Your education is a significant investment that you should get the most out of. In order to get the most out of this class and earn a solid grade, you need to be willing (and able) to invest a significant amount of time and energy. How much time? Between readings, homework, and lab preparation/reporting, you will need to set *at least* aside 1 - 2 hours *each day*. If you have question about how to organize and use your time out of class wisely, please come a talk to me!

D2L Course Site



All course documents, including assignments, rubrics, the syllabus, and other supporting material, can be found on the course D2L site (login at <https://uwsp.courses.wisconsin.edu>). Your exam, quiz, assignment, and lab grades, along with your overall course grade, can be found on this site as well. I will post content and update grades almost every day, so be sure to check D2L often.

E-Mail



Please feel free to email me at dave.snyder@uwsp.edu if you have any questions or concerns during the semester. While I may not be able to reply to your messages instantly, I will do my best to reply as quickly as possible. Email messages should be professionally formatted, should include an appropriate salutation (e.g., “Dear Dr. Snyder”), an appropriate closing (“Sincerely, Steve E. Pointer”), and should be written in Standard English. Sending me e-mails is a good opportunity to develop or improve your professional communication skills. Please keep in mind that university emails are public records.

Support and Help is Available!

Instructor and Tutoring Support

- **Instructor Office Hours:** During office hours, I am available to assist you in all aspects of this course. You do not need to make an appointment to stop by during “drop-in” office hours but should contact me in advance for appointments at other times. I expect that you will need help with this course and am always happy to work with you.
- **Individual Tutoring:** Drop-in tutoring is available through the UWSP Tutoring/Learning Center (TLC). Schedules and locations for tutoring can be found on the TLC website: <http://www.uwsp.edu/tlc>

Disability Services

The University of Wisconsin Stevens Point is committed to providing students with disabilities the academic accommodations and auxiliary aids necessary to ensure access to all university services, programs and activities. In addition to the university's campus wide efforts to promote access and inclusion, students with disabilities are further accommodated based on specific individual needs. The Disability and Assistive Technology Center (DATC) is responsible for determining these accommodations. They provide services and assistance to enrolled students who are either permanently or temporarily disabled.

- The registration process can take up to 3 weeks to complete, so if you believe you will require accommodations, begin the process as soon as possible. To start the process, contact The Disability and Assistive Technology Center (DATC) at 715-346-3365 or emailing datctr@uwsp.edu
- UWSP has many services for students offered by various offices. Although decisions regarding disability specific accommodations are made on a case by case basis.
- Visit the Disability and Assistive Technology Center (DATC) website at: <http://www.uwsp.edu/disability/Pages/default.aspx> for information on services offered to students with specific disabilities

Course Policies

Participation and Attendance Policy

No formal attendance policy will be enforced during the semester; however, failure to attend lecture, lab, or discussion is likely to have a negative impact on learning and grades. You are responsible for all materials and assignments regardless of whether you are in attendance or not. You should also be aware that, in some cases, failure to attend class on a regular basis may negatively affect your enrollment status and financial aid. I will take regular attendance for informational purposes.

Academic Integrity Policy

The Board of Regents, administrators, faculty, academic staff and students of the University of Wisconsin system believe that academic honesty and integrity are fundamental to the mission of higher education and of the University of Wisconsin system. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors. Students who violate these standards will be confronted and must accept the consequences of their actions. **Please be aware that the penalties for academic misconduct can include suspension or expulsion from the university.** More information on UWSP academic standards and disciplinary procedures pertaining to academic misconduct can be found at:

<http://www.uwsp.edu/admin/stuaffairs/rights/rightsChap14.pdf>

Late Work /Missed Test Policy

- Late homework, lab reports, and discussion assignments will be assessed a 50% penalty. The deduction will be taken from the total points a student earns on the assignment (example: a student who earns 8/10 on a late homework will receive 4 points instead of 8). An assignment will be considered late if it is turned in after 5:00 PM on the day that it is due.
- No credit will be given for homework turned in after the assignment has been graded and returned and the solution key has been posted to D2L
- If you know that you will be unable to attend a period in which a test or exam is to be given, you must notify the instructor in writing (e-mail is fine) at least *one week* in advance in order to

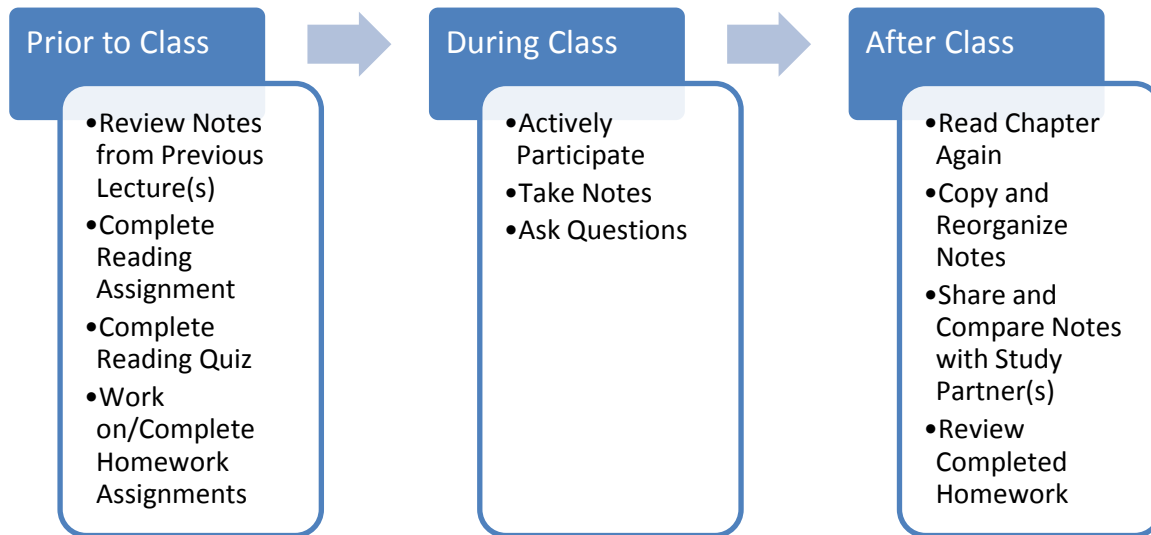
schedule a make-up test or exam. This includes students who must miss class due to university sanctioned events or scheduled military service.

- Final exams will not be given before the scheduled exam period. Final exams will not be returned to students but will be available for students to review until the end of the following semester
- The instructor reserves the right to change or amend these policies at his discretion on a case-by-case basis. He further reserves the right to require documentation of illness or extraordinary circumstances that might precludes students from successfully completing course requirements.

Electronics use Policy

An electronics usage policy is included along with this syllabus. Students must sign and return the policy before the end of the second week of class. The purpose of this policy is to help ensure a safe and distraction-free learning environment. If a student repeatedly violates this policy or if there are significant complaints from other students regarding electronics usage in the classroom or lab, the instructor will have no choice but to pursue disciplinary action. This may include referral of the matter to the Dean of Students.

Your Learning Experience: Lecture and Discussion



Lecture Prep Materials

Lecture prep materials will be posted to D2L in advance of each lecture. These materials will include a reading assignment, a set of suggested problems to work from the textbook, and a set of questions to answer while reading. While these assignments are ungraded, they are valuable study aids, and when preparing lectures, I assume that you have completed these exercises. Be prepared to answer questions regarding reading material in lecture.

Homework Assignments

Homework assignments are designed to give you the opportunity to practice and demonstrate your mastery of skills taught in class and lab. In order for homework to be an effective learning tool, you must write complete solutions to all of your problems, including detailed explanations for your solutions where appropriate. When you receive your graded homework from me, it is vitally important that you review and correct any problems you missed. In order to receive credit for homework assignments, you must:

1. Submit your answers on the answer sheet provided. All answers must include appropriate significant figures, units, and labels in order to receive full credit. Answers are worth a maximum of 7 points.
2. Attach a complete set of solutions to your answer sheet. Complete solutions are worth a maximum of 3 points.
3. Failure to submit both answers and solutions will result in a score of zero for the assignment.

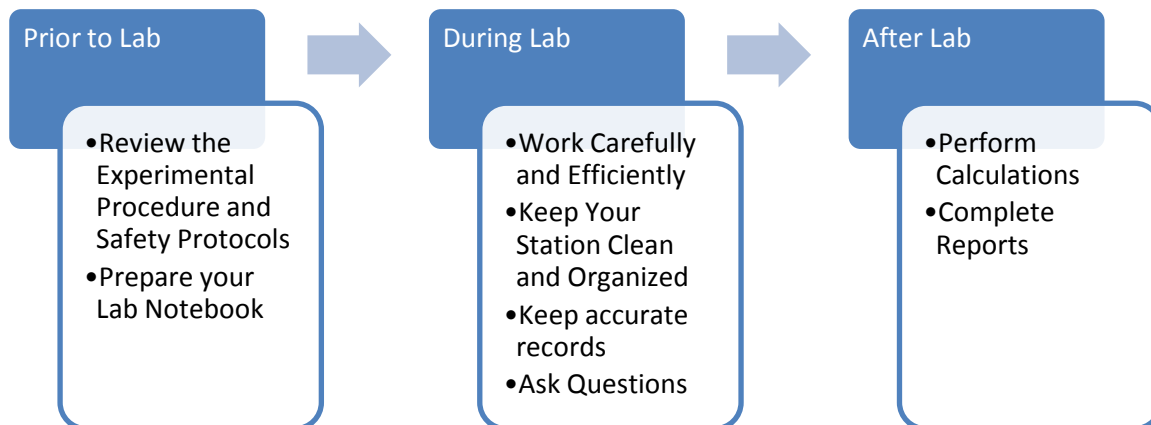
Unit Tests

Homework assignments are examples of *formative* assessments and are designed to help you to learn. Tests are examples of *summative* assessments and are designed for you to demonstrate what you have learned. Unit tests will be given in two parts. Part 1 will consist of extended response questions (“story problems”) and will be given in lecture. Part 2 will consist of multiple choice, matching, or fill-in-the-blank questions and will be given during discussion. *Unit tests are cumulative*, that is to say that any item from Test 1 is fair game for Test 2. Units test will take place during Wednesday lectures (see the tentative course schedule on page 12 of this syllabus) and the Thursday discussion periods that follows that lecture.

The Final Exam

The final exam is a cumulative exam and will cover material from Units 1 – 3 and material not covered on the Unit 3 test (this will include material covered during the last week or so of class). The final exam will take place on Thursday, December 20th, from 8:00 – 10:00 CBB 265.

Your Learning Experience: Laboratory



Laboratory Notebook

Learning to keep proper laboratory records is critically important. Any time you are working in a lab, you should write your observations and measurements in a laboratory notebook. This semester, you will learn how to correctly set up and maintain a laboratory notebook. In successive chemistry courses, the requirements for your notebook will become more demanding, so learning the basics and developing good record-keeping habits will help you in the future. You will be expected to prepare your lab notebook *before* attending lab (your lab instructor will look over your notebook prior to lab each week) and to turn in duplicate copies of your lab notebook pages with your lab report. Deficiencies in your lab notebook will result in deductions from your laboratory report score.

Laboratory Reports

Laboratory reports are due by 5:00 PM on the Monday following the lab period. Lab reports should be type-written (not hand written) with graphs, tables, and other supporting materials attached (stapled). Copies of the lab reports as word documents can be found on D2L.

Grading Information

The final course grade will be determined by an absolute point scale as shown below. Numbers in parentheses represent the approximate number of items in each category.

Item	Point (Each)	Points (Total)
Unit Tests (3)	100	300
Final Exam (1)	150	150
Lab Reports (10)	10	100
Discussion Exercises (8)	10	80
Homework (8)	10	80
Total		710

The following scale will be used to assign letter grades. Note that at UWSP, a grade of "D-" is not given.

Grade	Points Range	Grade	Points Range
A	710 – 661	C+	567 – 540
A-	660 – 639	C	539 – 518
B+	638 – 610	C-	517 – 497
B	609 – 589	D+	596 – 469
B-	588 – 568	D	468 – 447
		F	446 – 0

A Note about Final Course Grades

I invite you to come and discuss your grade with me at any time during the semester. I welcome these conversations, and I am more than happy to help you to develop study strategies that can assist you in becoming a better thinker, learner and problem solver – skills that can help you to improve your grade. Additionally, if I have made a mistake in grading an assignment (it happens – I am not perfect!), I want to know right away so that I can correct the error. However, unless a mistake has been made in calculating your final grade, course grades posted after the final exam are final and not subject to change. I always take a look at your grade and will round in your favor if you are in-between grades; however, I do not “bump” students up to a higher grade, provide extra credit or work opportunities, or change the grading scale after the final exam has been completed.

Course Outline (Tentative)

Week	Dates	Chapter(s)	Events	Topics Covered
1	9/4 – 9/7	1		The Nature of Matter and Atomism
2 [†]	9/10 – 9/14	1,2		Making Measurements/ Atomic Models
3	9/17 – 9/21	2,3		Periodic Table/ Mole Concept/ Light
4	9/24 – 9/28	3		Bohr Model/ Quantum Theory
5	10/1 – 10/5	3,4		Periodic Trends/ Bonds/ Nomenclature
6	10/8 – 10/12	4	Unit Test 1	Lewis Symbols and Structures
7	10/15 – 10/19	4,5		Bonding/ VSEPR Theory/ Polarity
8	10/22 – 10/26	5,6		Valence Bond Theory/ MO Theory/ IMFs
9	10/29 – 11/2	6,7		Phase Diagrams/ Reactions/ Stoichiometry
10 [‡]	11/5 – 11/9	7	Unit Test 2	Stoichiometry/ Composition/ Empirical Formulas
11	11/12 – 11/16	7,8		Limiting Reactants/ Units of Concentrations
12	11/19 – 11/23	8	Thanksgiving	Concentrations/ Solution Stoichiometry
13	11/26 – 11/30	8,9		Acid-Base/Solubility/ Titrations/ Heat
14	12/3 – 12/7	9	Units Test 3	Heat Capacity/ Enthalpy/ Calorimetry
15	12/10 – 12/14	9		Hess's Law/ Bond Enthalpy
16	12/20		Final Exam	Cumulative Exam (8:00 AM – 10:00 AM)

Other Important Dates:

[†]Sept 13: Last day to add a course or drop a course without a grade (course will not appear on transcript)

[‡]Nov 9: Last day to drop a course (a grade of "W" will appear on transcript)

Laboratory Schedule (Tentative)

Week 1	Dates	Experiment
1	September 7	Safety and Check In
2	September 14	Precision vs. Accuracy in Scientific Measurements and Calculations
3	September 21	Water Content of a Hydrated Salt
4	September 28	Introduction to Absorption Spectrophotometry
5	October 5	Colorimetric Identification of Iron
6	October 12	Periodic Properties
7	October 19	Lewis Formulas & Molecular Models
8	October 26	Spectrophotometric Analysis for Iron in Cereals
9	November 2	Intermolecular Forces
10	November 9	Separation of a Mixture
11	November 16	Limiting Reactant
12	November 23	No Lab – Thanksgiving Break
13	November 30	Introduction to Titrations: KHP Titration
14	December 7	Vinegar – Is the Label Truthful?
15	December 14	Check-Out