

Chmy 141.002: College Chemistry I MWF 11:40 am-12:40 pm, Sci Aud

Instructor: Steven Wiles

Phone: 657-1648 **Fax:** 657-2342

Office: Sci 216

Email: steven.wiles@msubillings.edu

Office Hours: 10-11am TR, 12:30-1:30 T, 2-3pm WF

Also, whenever my door is open or by appointment.

Text: "Chemistry: The Essential Science", 11th ed, Brown/LeMay/Brusten/Murphy, Pearson-Prentice Hall

Course Description:

This course introduces the fundamental concepts of chemistry, including atomic and molecular structure, stoichiometry, chemical bonding, and the laws governing the relationships of the elements and compounds. You need to be competent in college-level algebra (passed Math 105 or the math placement exam)

Course Goals:

Student goals:

- Prepare for each lecture with assigned readings and by completing assigned homework
- Participate in class by asking questions and discussing topics.
- Form study groups with other students in the course. This interaction group will turn out to be one of your greatest resources in the course.

Teacher goals:

- Teach the student the vocabulary of chemistry.
- Help the student understand the basic principles of chemistry.
- Give the student confidence and competence to discuss and apply chemistry outside of the classroom.
- Show the student the connection between chemistry and other disciplines of science, as well as the impact of chemistry in and on society.
- Help students develop logical and problem-solving skills.

Grading:

4 Exams	4x100 = 400 pts
Homework	200 pts
Final Exam	200 pts
Total	800 pts

Letter grades in the course will be based on the standard scale (90%-100% = A, 80%-89% = B, etc.).

Letter grades will be appended with +/- at the instructor's discretion (generally, + for upper 3 percentile, - for lower three). At the end of the semester, when final grades are completed, the scale *may* be adjusted to ensure a fair distribution of grades to the class. If such adjustment occurs, it will **never lower** a student's grade.

Homework: Your homework will be assigned and graded using the MasteringChemistry online service. MasteringChemistry is a web-based program provided by the publishers of your textbook. It gives immediate feedback on work, provides hints with some problems, and automatically grades your work. Instructions for registering and using this web-based service are included in a pamphlet packaged with your textbook or found at the publisher's website (CourseID: WILESCHMY141F09). If you bought your textbook used, you can buy a login code directly from the publisher's webpage.

Exams: We will have three 1-hour exams at roughly 3 week intervals on the following chapters:

Exam 1: Chapters 1 & 2

Exam 2: Chapters 3 & 4

Exam 3: Chapters 10 & 5

Exam 4: Chapters 6 & 7

Final Exam: Comprehensive and also Chapter 8 (through section 5)

Exams will be held during regular lecture hours, as scheduled at the end of this syllabus. You will be allowed only a calculator and a pencil during the exam. Scratch paper will be provided, if necessary. Your books and bags will be stored at the front of the room during exams. Cell phones should be set to *vibrate* only during the exam and stowed. If you wish to use the restroom during the exam you must be escorted, either by the professor or a designated person (so go before the test, please). You must take off any hat, cap, or sunglasses during the exam.

Final Exam: The final exam for this course will be administered on Monday, December 14th at 12:00-1:55 pm in the Science Auditorium. The final exam is **comprehensive** for the semester (the American Chemical Society's First Semester National Standardized Exam)

Make-up Exams: Students who are aware beforehand that they will be unable to attend an exam at the scheduled time can arrange a time and take the exam up to a day *early*. Otherwise, all make-up exams will be administered on December 10th, the last Thursday before finals week, starting at 9:00am. If a student cannot come in at 9:00am, another time that day should be arranged by appointment. Any exams the student has missed can be made up at this time; otherwise, they will receive a zero. The make-up exams will not be the same as the original exams, and in general will be somewhat more difficult.

Calculators: Students will need to purchase a simple **scientific calculator** for this course (capable of calculating trigonometric functions, exponentials and logarithms, and expressing scientific notation). They do not need to purchase expensive engineering calculators with graphing functions and programmability. You may not be allowed to use these types of calculators during exams. Cell phone calculators are insufficient for this course, and will also not be allowed during exams. Bring extra batteries for your calculator with you. If a student forgets their calculator or it dies, they will have to do all calculations by hand.

Attendance: I will not be basing any portion of your grade on attendance *directly*. However, it is wise to always try to be in class. Students who regularly miss lecture perform *significantly* more poorly on exams. I will be asking questions of all students in class during the course of the semester, and I will note absences.

Extra Credit: No extra credit will be given in this course for any reason. Please don't ask.

Incompletes: Incomplete grades in this course are only given if the student is prevented from completing a significant portion of their coursework due to a serious family or medical emergency. Documentation of the emergency **must** be provided by the student.

Curriculum:

<u>Date</u>	<u>Chapter & Section</u>	<u>Topic</u>
Sept	9 1.1-1.2	intro to chemistry, scientific method, classification of matter
	11 1.3-1.5	properties of matter, measurement, numbers
	14 1.6	conversion factors, dimensional analysis
	16 2.1-2.4	the atomic theory, atomic structure, atomic numbers and weights, isotopes
	18 2.5-2.7	the Periodic Table, molecular and ionic compounds
	21 2.8	chemical formulas and nomenclature
	23	Examination #1
	25 3.1-3.2, 3.4	balancing simple chemical equations, Avagadro's number and moles, formula and molecular weight
	28 3.3-3.5	percent composition, empirical formulas for data
	30 3.6	quantitative information from balanced equations
Oct	2 3.7	limiting reactants, theoretical/actual/percent yield
	5 4.1-4.2	solutions, electrolytes and dissociation, precipitation reactions, solubility
	7 4.3	acid-base (neutralization) reactions
	9 4.4	oxidation-reduction (redox) reactions
	12 4.5	concentration, dilution
	14 4.6	solution stoichiometry, titration
	16	Examination #2
	19 10.1-10.3	characteristics of gases, pressure, gas laws
	21 10.4-10.5	the Ideal Gas Law
	23 10.6-10.7	Dalton's Law, Kinetic Molecular Theory
26 10.8-10.9	effusion and diffusion, deviations from ideal behavior	
28 5.1-5.2	energy, energy changes, the Zeroth and First Laws of Thermodynamics	
30 5.3-5.4	enthalpy of chemical reactions	
Nov	2 5.5-5.6	specific heat, calorimetry, Hess' Law
	4 5.7	standard enthalpy of formation and reaction
	6 6.1-6.2	the wave nature of light, the photoelectric effect, Plank's formula and the photon
	9	Examination #3
	11	<i>Veteran's Day</i>
	13 6.3-6.4	the Bohr model of the atom, wave/particle duality of the electron
	16 6.5-6.6	quantum mechanics, orbitals and quantum numbers, the hydrogen atom
	18 6.7-6.8	many-electron atoms, electron configurations
	20 6.9, 7.1-7.2	anomalous electron configurations, the Periodic Table, effective nuclear charge
	23 7.3-7.4	periodic variation of atomic and ionic sizes, ionization energy
25	<i>Thanksgiving Break</i>	
27	<i>Thanksgiving Break</i>	
30 7.5-7.6	electron affinity, metallic vs. nonmetallic properties	
Dec	2 7.7-7.8	trends in chemical properties
	4	Examination #4
	7 8.1-8.3	Lewis dot symbols, the octet rule, ionic and covalent bonding
	9 8.4-8.5	bond polarity and electronegativity, Lewis structures
	11	<i>Wrap-up & review</i>

Final Exam: Dec. 14th, 12:00pm-1:50pm, Sci Aud

Note, the schedule above is tentative, and subject to change as necessary.

Suggestions for Studying and Learning Chemistry:

- It is **strongly** recommended that you join a study group for working on homework and studying together. Groups of 2-4 people seem to work best.
- In a standard university level course such as this, you should expect to spend around 2-3 hours studying outside of class for every 1 hour spent in lecture. This time includes working on homework, reading the textbook, and studying your notes. Make sure that you schedule yourself enough time in the week.
- Begin all homework assignments **immediately** after posting. Waiting to begin until nearly the due date gives you very little time to get help from me. Turnaround time on emailed questions is usually one to two days. Stay on top of the work, or you will become overwhelmed and never catch up. Late assignments receive a **zero**, and I only give extensions for *emergency* situations.
- Spending more than 15-20 minutes on a single homework problem without progress is rarely an effective use of your time. What to do? Come to my office hours or contact me by phone or e-mail. I am your **best** resource in this course; your ability to interact with me *personally* is the advantage of campus courses over online or correspondence courses. Chemistry and math tutors are often available at the Academic Support Center. I keep a listing of local tutors on my faculty webpage as well.
- Although you will only be submitting the answers to homework problems in MasteringChemistry, it is important to develop the habit of showing your step-by-step work on *paper*. Record this work clearly and in a well-organized fashion. You will often have to show work on exams to receive any credit for calculation problems, so it is best to build this habit early. Keep your work in a safe place; it will be a valuable study resource for upcoming exams.
- Check the course website regularly for announcement. Any information posted on the website is treated the same as if I announced it in lecture. I frequently post information between lectures in response to issues students are having with homework assignments. Also check the MasteringChemistry site regular for new assignments. I occasionally repost altered homework problems when students point out errors or ambiguities in the original problem. If you miss these repostings you will receive a **zero** for that work.
- Take good lecture notes. I use PowerPoint presentations in class as lecture *aids* and make them available for download. They are **not** a substitute for *your own notes*. I advise you to print these slides before class (3 slides to a page is best) and use them as an *outline* to your own note-taking.
- Using lecture notes in conjunction with the text will be the best way to determine which material to study. Compare your notes with the notes of other students, to fill in things you may have missed during lecture or to see if their understanding of the material is different from yours.
- Skim topics *before* they are covered in lecture, so that you aren't seeing material for the first time at lecture. The PowerPoint presentations are useful in this capacity as well.
- After lecture, *carefully* read the topics covered in class to fix them in your mind. Considering how much you paid for your textbook, it is foolish not to read it. When reading, periodically ask yourself "Why is this true?", "What does this mean?", "What is this used for?", etc. Research on memory shows that people remember concepts best if

they have *thought* about them and *attached meaning* to the ideas. Things they have just “looked at”, even a lot, have no sticking power in the memory. This is where discussion of concepts with fellow students can also help.

- How can you tell if you understand a topic? As a self-test, try explaining a concept from class to someone (for example, someone in your study group). If you can't verbally describe a concept clearly to someone else, **you simply don't understand it**.
- If you find that you are unable to answer a homework question solely by using your own textbook or notes, other introductory chemistry textbooks are available for your use in the Science Library (Room 110 in the Science Building). The Internet is another valuable resource for tracking down information (Google, Wikipedia, etc.). Medical professionals and scientists rely heavily on the Internet these days, so you might as well begin practicing now. Internet access is available to all students at various sites on campus.
- Keep up with your study day to day. If you fall behind, it is very difficult, if not impossible, to catch up. Perseverance is the key to success.

POLICY ON ACADEMIC HONESTY: It is your responsibility to familiarize yourself with the Student Handbook. In particular, you should understand Part IX: Code of Conduct, paying special attention to subsection B.1, page 78 (Academic Misconduct). All students are expected to adhere to the highest standards of academic honesty and refrain from any action that is dishonorable or unethical. In all examinations, quizzes, and lab reports, students are expected to submit their own work entirely. Cheating or *alleged* cheating on an exam or quiz in this class will result in a grade of zero (failure) for the exam or quiz involved, and may lead to a zero in the course.

POLICY ON STUDENT CONDUCT: Disruptive behavior such as loudly talking amongst yourselves, ringing cell phones, talking on cell phones, and reading non-course material during lecture will not be tolerated. Any students indulging in such behavior will be asked to leave the class. Cell phones must be turned off prior to lecture.

Occasionally, a student will have a disagreement with the professor or with the teaching assistants over an issue of grading. Such discussions, whether in class or in office, are to be kept civil. Verbal abuse in any form will NOT be tolerated. Any student indulging in such behavior will be reported to the Dean of Arts and Sciences and The Office of Student Affairs.

DISABILITY SUPPORT SERVICES: Students with documented disabilities, whether physical, learning, or psychological, who believe that they may need accommodations in this class, are encouraged to contact Disability Support Services as soon as possible to ensure that such accommodations are implemented in a timely fashion. Please meet with [DSS] staff to verify your eligibility for any classroom accommodations and for academic assistance related to your disability. Disability Support Services is located in the Academic Support Center, 657-2283 and the College of Technology, 247-3029.

POLICY ON GIVING OUT GRADES: It is against university policy for a professor to discuss a student's grades over the phone or by e-mail. Grades can only be discussed in person. Students who wish to inquire about their grades should come during office hours or schedule an appointment.