

Course Syllabus and General Information

Chemistry 126-D
Fall, 2012
TWTh 10:00-10:50
Recitation: Friday 10:00

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Text and Supplies:

- ❖ The textbook: *Chemistry: A Molecular Approach*, by Nivaldo Tro, 2nd Edition, 2011
- ❖ Mastering Chemistry web access
- ❖ A three-ring binder will be very convenient for keeping your notes (PowerPoint handouts) organized.
- ❖ A calculator capable of displaying scientific notation and logarithms (base 10 for first semester and natural logs for second semester)
- ❖ An open mind, willingness to learn a wonderful subject, and dedication

Goals:

- Follow the American Chemical Society national guidelines for teaching this course
- Increase your knowledge of chemistry and prepare you for a degree in the natural sciences
- Increase your analytical and problem solving skills in a chemistry setting

Chapters, Topics, and TENTATIVE Daily Table:

Jan. 17	Welcome back, Review, Syllabus...
Jan. 18	11.1-11.3: Comparing solids, liquids & gases, intermolecular forces
Jan. 19	11.4-11.5: Intermolecular forces at work, vaporization
Jan. 24	11.5-11.6: Vaporization & dynamic equilibrium, sublimation & fusion
Jan. 25	11.7-11.9, 11.12: Heating curve of water, phase diagrams, properties of water, solid types
Jan. 26	12.1-12.3: Types of solutions & solubility, energetics of solution formation
Jan. 31	12.4-12.5: Solution equilibrium & factors affecting solubility, expressing solution conc.

Feb. 1	12.6-12.7: Vapor pressure of solutions, freezing point depression
Feb. 2	12.7-12.8: Boiling point elevation, osmosis, colligative properties, colloids
Feb. 7	CH 12 Problem Solving
Feb. 8	14.1-14.3: Concept of dynamic equilibrium, equilibrium constant (K)
Feb. 9	14.4-14.7: K in terms of pressure, heterogeneous equilibria, calculating K, reaction quotient
Feb. 14	14.7: calculating K, reaction quotient
Feb. 15	14.8, 14.9, 17.8-9: Finding equilibrium concentrations
Feb. 16	Ch 14 Problems
Feb. 21	15.1-15.4: Nature & definitions of acids & bases, acid strength & the acid ionization const.
Feb. 22	15.5-15.6: Autoionization of water & pH, the $[H_3O^+]$ & pH of strong & weak acid solutions
Feb. 23	Working Problems and Review as needed
Feb. 24 Fri	Exam #1 (Chapters 11, 12, 14, 17.8-17.9)
Feb. 28	Problem Solving? Calculations involving acid solutions
Feb. 29	15.7-15.8: Base solutions, acid-base properties of ions & salts
Mar. 1	Problem Solving? Calculations involving base solutions & ions
Mar. 6	15.9-15.11: Polyprotic acids, acid strength & molecular structure, Lewis acids & bases
Mar. 7	16.1-16.2: Buffers: solutions that resist pH change
Mar. 8	Problem Solving? Calculating the pH of a buffer solution
Mar. 10-25	Spring Break
Mar. 27	16.2-16.3: Calc. pH changes in a buffer, buffers of a base & conj. acid, buffer effectiveness
Mar. 28	16.4: Titration and pH curves
Mar. 29	Problem Solving? Calculating pH changes in a buffer solutions & the pH during a titration
Apr. 3	16.5: Solubility equilibria & the solubility product constant
Apr. 4	Working Problems and Review as needed
Apr. 5	Review/Problem Solving
Apr. 6 Fri	Exam #2 (Chapters 15 & 16)
Apr. 10	Whitman Undergraduate Conference, No Class
Apr. 11	18.1-18.3: Balancing oxidation-reduction equations, voltaic cells
Apr. 12	18.4-18.5: Standard reduction potentials, cell potential, free energy & the equil. const.
Apr. 17	18.6, 18.8: Cell potential and concentration, electrolysis: driving nonspontaneous rxns.
Apr. 18	18.7, 18.9, 13.1-13.2: Batteries, corrosion, rate of a chemical reaction
Apr. 19	13.3-13.4: Rate law & integrated rate law: concentration, reaction rate, & time
Apr. 24	13.5-13.7: Effect of temperature on reaction rate
Apr. 25	13.6-13.7: Reaction mechanisms, catalysis
Apr. 26	Ch 19: Radiation, basic principles
May 1	Ch 19: Radiation, in the real world

May 2	Review/Problem Solving
May 3	Special Topic: Global Warming or Hydrophobic Pollutants
May 4, Fri	Exam #3 (Chapters 13, 18, 19)
May 8	Review for final
May 13	Final exam (Standardized and Cumulative!)

FINAL EXAM: Saturday, May 12, 9:00-11:00 pm.

This will be a timed COMPREHENSIVE FINAL EXAM (American Chemical Society National Undergraduate Chemistry Exam). The final exam time is scheduled by the registrar. The schedule is published well in advance of the final and I cannot change this. Therefore it is your responsibility to plan accordingly as there are strict limitations set by the College on exceptions to the final exam schedule.

Lectures: Power-Point based lectures with chalkboard work, workshops, and demonstrations. My homepage is posted at <http://www.whitman.edu/~dunnivfm>. The purpose of giving out my lecture notes and handing out other crucial lecture material IS to allow you to listen to the lecture and class discussion without having to frantically copy the material on an overhead. It IS NOT to allow you to skip class and assume that you can learn everything from the posted lectures. As you will see, everything that we do in class is not contained in my PowerPoint handouts. As students ask questions, we will go off on tangents from the main subject, and these tangential subjects will be covered on the exams. If poor attendance becomes a problem, I will start giving pop quizzes (in addition to the Tuesday quizzes). Please bring the printed handouts to every class since we will proceed at a pace that assumes that you have the notes. There is no need to bring you relatively large and heavy textbook to class. I will have a recitation on Friday during our class time/slot.

Weekly Tutoring Session: There will student-led tutoring sessions on Sunday through Thursday; I will notify you of this schedule. The location will probably be the chalkboard area on second floor at the top of the stairs of the new wing. This will not be a lecture. It is designed to give you an unlimited opportunity to ask questions, but you must come with specific problems to work.

Attendance/Class Etiquette: **Prompt attendance** is expected at every class meeting. **NO CELL PHONE USE! If your cell phone rings/beeps/vibrates during class: first offence you will stand and apologize to the class, second offence you will leave the room for the remainder of the class! Also, no computer use or texting will be allowed during class.**

Recitations: Tentatively, as needed in room 376, I will be offering additional help/lectures/workshops. Attendance is optional but important material will be covered to aid in the understanding of complicated concepts such as equilibrium, acid-base equilibrium, and kinetics that were covered during our normal class time. For most of this semester, we will be working additional problems and discussing problem solving skills. You will be responsible for this material since it will have also been covered in

our regularly scheduled classes. **Recitations are an extra effort and time on my part and I do these to improve your grade.**

*****Missed Exams/Quizzes:** There will be no make-ups for missed exams unless you have a documented illness (a note from a doctor or health clinic) or a death in your immediate family **and I am notified one full day before the exam** (this does not mean an e-mail the night before or during the missed class). Athletes may make arrangements if they must be away, but only if (1) this is done well in advance, (2) the absence is due to a game, not a practice, and finally (3) any make-up requires my pre-approval; all of these cases will require you to take the exam in advance. Monday quizzes can be made up only on my approval (**and a four day prior notification; on Friday before the Tuesday quiz**).

Quizzes: Every Tuesday, at the beginning of class, there will be a ~10 minute quiz. The material covered on the quiz will be taken from material covered during the week before. These will be graded on a basis of 1 to 10, with a score of 10 being perfect. The purpose of these quizzes is not to overburden you with studying, but to let me know if I am clearly covering the material (on a weekly basis). These quizzes will also let you know what I think is important and give you an idea of what type of questions will be on the hourly and final exams. Due to time constraints, quiz questions tend to be easier than exam questions. In the past, students have commented that these weekly quizzes are one of the best ways to keep up with the material.

Homework: My section will be using the Mastering Chemistry option offered by Prentice Hall Publishing. This offers an automatic graded homework that you will use on-line.

Office Hours: I generally keep an open door policy; if you can find me I will help you; Tuesday and Thursday afternoon are best. However please respect my "quite office hours" when I am preparing for class. Most afternoons are great times to catch me in room 341 (my large lab across from my office). On Monday and Wednesday afternoons I have a laboratory, but you are welcome to stop by and see if I have time to answer questions. If you would like to make a specific appointment, please contact me via email or just stop by my office.

Overall Grading: Grades will be based on the following basis:

Item	Points
Three-hour exams (short answer, discussion, & problems)	300
Monday Quizzes (based on 13/14 quizzes)	130/140
Homework (Mastering Chemistry)	50
Final exam (ACS Standard Exam)	200
Total	680/690

The above represents an approximate breakdown. I reserve the right as instructor to take into account attendance, effort, participation, and overall professionalism in my final grade determination. This has pleasantly affected several grades in the past.

You can constantly check the status of your grade, if you choose to participate in the "virtual grade book" on my home page. I encourage you to do this since I am also capable of making mistakes and if you have access to your grades you can call the error to my attention. Also your secret code will be used to identify your exams when these are placed outside my office door.

Academic Integrity/Honesty Policy: A very clear policy is given in your student handbook. I adhere to the College's policy of Academic Honesty, which you have or will sign in the presence of your advisor. This means that cheating, plagiarism and other forms of academic dishonesty, as defined in the policy, will not be permitted in this class and that the penalties stated in the policy will apply. Cheating of any type (on quizzes or exams, conducting dry labs, or when the lab reports or answers of two students are too similar) will guarantee you a trip to the Dean's office and depending on the severity of the offense, an "F" in the class and expulsion from college.

Exam Schedule/Timing: It is difficult to fairly evaluate your knowledge of the material in an hourly exam. Remembering back to my college years, I always hated timed exams since they add an unneeded (and unwanted) element of pressure. Therefore, with the classes consent, I will be giving the exams on Fridays in the Hall of Science's classrooms (rooms on the first floor of the atrium). The schedule is subject to change given student feedback, but exams can be taken from 12:00 to 4:00 on selected Friday afternoons. They will consist of discussion, short answer, true/false, and mathematical problems. Exams will be prepared as a one-hour test (if you perfectly understand the material), but you may have the complete four-hour period.

Keys to Earning A Good Grade:

- use multiple forms of learning as discussed in class
- come to every class
- read the textbook material before coming to class
- work the suggested homework problems in the text and online
- come to the tutors (or me) for help when you do not understand something