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MWF 9-9:50 am in Hartline Science Center G42

Laboratory Sections all meet in Hartline 220: Section 1 (Dr. Ed A'Zary) Tues 9:30-12:20 pm; Section 2 (Dr. Garland Crawford) Tues 2-4:50 pm; Section 3 (Dr. Garland Crawford) Tues 5:30-8:20 pm.

**OPTIONAL Review Session Friday 1-2 pm Location Hartline 263**

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Professor: Dr. John P. Morgan, Office: Hartline 240, 389-5316

jmorgan@bloomu.edu (Email is the most reliable way to contact me. Expect a reply within 24 hours. **If you need emergency help**, please contact the department secretary and he will get in touch with me via phone.)

Office Hours: Mon 12-2 pm; Tues, Wed, Fri 12-1 pm or by appointment

**You are encouraged to stop by my office if you have problems or questions! If my door is open, chances are good that I'll help you immediately, even without an appointment.**

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**A Note to the Student:** Chemistry 115 is undergoing a significant redesign. With feedback from previous students and fellow faculty members, we are attempting to change how *Chem Sci 1* prepares students for future science study. Our new goals include:

- 1) To understand **concepts** over elaborate calculations. Proficiency in basic chemical calculations will be developed.
- 2) To survey most relevant topics in General Chemistry at a **practical level** rather than focus on specifics that will not be used in future science courses
- 3) **To be less dependent on Chemistry 116** to "round out" your General Chemistry knowledge.

Note that we are not talking about making the course easier! In fact we will be covering **MORE** topics than in the past, so staying up to date is critical to success!

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Required Texts: 1) *Chemistry: a Molecular Approach* with Student Access Kit, by Nivaldo Tro, 1<sup>st</sup> edition, Pearson Prentice Hall, 2008. ISBN 9780321604286. **Please note that we ARE using the Mastering Chemistry online module**, so you should get a Mastering Chemistry access kit with a NEW text. If you are purchasing a used text, you may sign up online for Mastering Chemistry at [www.masteringgeneralchemistry.com](http://www.masteringgeneralchemistry.com) with a credit card.

2) Laboratory Exercises for Chemistry for the Sciences 1, Fall 2010 edition, Bloomsburg University. **Note that this version is significantly different from all previous versions! It is available for purchase from the Chemistry Club. See Dr. Mark Tapsak for details (Hartline 241).**

**For lab, you will also need a composition (NOT spiral bound) notebook and your own pair of safety glasses (LABEL them with your name!). For class AND lab, you'll need an inexpensive scientific calculator (calculators that are capable of storing alphabetic characters or transmit information are forbidden for use on exams and quizzes). A scientific calculator is capable of expressing numbers in scientific notation as well as decimal notation, and it contains the log and ln functions.**

Grading: Three exams: 35% (F Oct 1st; F Oct 29th; Tues Nov 23rd)  
**Comprehensive** Final Exam: 20% (Thurs Dec 16th, 3:30-5:30 pm)  
Laboratory: 25% (a separate syllabus will be given by lab instructor)  
Quizzes (every other Friday): 10% (your lowest quiz is dropped)  
Homework: 10% (Mastering Chemistry, with additional problems)  
*Extra credit offered at instructor's discretion*

**You will be assigned BOTH text problems and Mastering Chemistry problems. The majority of text problems will NOT be graded (they are for your practice!). Mastering Chemistry problems WILL be graded. I recognize that online homework tends to be problematic, so TWO written homework problems will also be graded with each set to make up for any "inaccuracies" in the online homework.**

**Late Policy: Late homework assignments are penalized 10% per DAY late.** Your laboratory instructor will provide additional details for lab assignments. Assignments are generally due for each 2 week period (generally 6 lectures worth of material). Be SURE to check the due date for the Mastering Chemistry homework CAREFULLY. **Mastering Chemistry assignments will generally be due on MONDAYS by 9:00 pm.**

*Tentative* Grade Scale:      90-100 = A      88-90 = A-  
   86-87 = B+      80-85 = B      78-79 = B-  
   74-77 = C+      67-73 = C      65-66 = C-  
   63-64 = D+      55-62 = D      0-54 = E

I reserve the right to lower the limits for the grade scale based on student performance. **This grading policy is not a curve!** However, your latter performance may influence your final grade, especially for borderline cases – improvement over the course of a semester will often be rewarded!

**Last day to withdraw from the course: F 11/5 – 4:30 pm.**

**\*\*Please see me *and* the Office of Accomodative Services (Ext. 4491) by the end of the first week of class if you have special needs for this class\*\***

*Exam Make-Up Policy:* A single exam missed due to a **valid excuse** will score the average of all other exams. If more than one exam is missed for a valid excuse, you will be required to make up the exam. Valid excuses include: 1) personal illness, as verified by a valid medical excuse, 2) death or critical illness in the immediate family, 3) participation in a university-sponsored activity, 4) Active government service, including but not limited to military duty. Exam dates are announced in this syllabus so you can

plan to be present. I must be notified of your absence **at least 24 hours prior** to the exam for a non-emergency situation. **For emergencies**, I will accept notification **up to 24 hours after the exam**. I can be contacted by phone or email. If I am not available, leave a message with the department secretary. In this regard, there is no excuse for not contacting me. It is your responsibility to verify that your message reached me! Excuses presented to me after the emergency period **will not be accepted for any reason**.

Quizzes cannot be made up for any reason. However your lowest quiz grade will be dropped. If you arrive late you will not be allowed to take the quiz.

**NOTE:** If you must leave campus for a family emergency, notify your dorm RA, dorm director, or the Office of Student Life (x4062). They will officially notify all of your professors that you had to leave school temporarily.

*Laboratory:* Separate grades will be assigned for laboratory work. For a detailed point breakdown please see the lab syllabus. The point breakdown and laboratory schedule may be altered at any time at instructor's discretion.

If you need to miss your assigned laboratory section for any reason, please talk to your laboratory instructor. Please note that there is a maximum of 18 students per lab section; additional students "just dropping by" cannot be accommodated for safety reasons.

*Code of Conduct:*

- **Be on time for class.** Lateness is never professional and disrupts the class.
- **Turn off and put away all devices that may make a disturbing noise**, including all communications devices (cell phone, PDA, MP3 player, etc.).
- **Be respectful of your fellow classmates: be quiet and remain in your seat during class.** Chances are that your peers are here to learn, not to listen to your dramatic recap of last night's sports game.
- **Be honest, both with regard to your own work and to others' as well.** We all have an idea of what is "academically honest", but if you have any questions please ask the instructor before engaging in the act. Any act of dishonesty committed by a student will result in an immediate "E" grade assignment for the term.
- **Realize that your classmate's life may depend on you!** This fact applies primarily to the laboratory. We are all responsible for safety.

**You will receive only one warning for violations of the code of conduct. Further problems will be "rewarded" by dismissal from that particular lecture/laboratory period. Repeat offenders may be removed from the course at instructor's discretion.**

*Nuggets of Wisdom:*

- **Work all problems and do all reading assignments!** Practice makes perfect, and chemistry is all about applying what you learn to new and interesting

situations. The only way to do this is to follow the Boy Scout Motto: **Be Prepared!**

- **Ask questions.** It is never appropriate to leave a question unasked. Whenever. Wherever. Whatever. For whatever reason.
- **Use the Internet.** A single lecture or reading assignment may be unclear, so use the online resources available to you. A good place to start is

[www.chemreview.net](http://www.chemreview.net) (contains free printable lessons on mathematics and chemistry for the first year student).

<http://www.800mainstreet.com/cl/101-online.html> (Contains an online introductory chemistry course. You may see some of Dr. Volland's examples in class!)

<http://chemistry.about.com/od/generalchemistry/> (Some useful links to information sources on general chemistry.)

- **Work on chemistry every day.** I do it, so can you. Why? Any chemist will tell you that chemistry has a high "vapor pressure." In other words, you need to constantly reinforce it to learn it well!
- **Have fun** with it. If you feel overwhelmed, stressed, or burnt out, you've been spending too much time with your chemistry. Take a break and get back to it later on. Understand your study/attention limits. It is useless to sit down for a six hour continuous study period if you can only concentrate for one-and-a-half hours!
- **Be honest with yourself.** An hour study session is ineffective if you take 15 minutes to talk to a friend on the cell, 10 minutes to answer emails, 15 minutes to watch your newest music videos on PodCast, and 15 minutes to IRC chat with your friends before sitting down for study (in the 5 remaining minutes!). Remove your distractions and work on your study habits and discipline.

**Course Outline:** This is the same outline that all sections of Chemistry 115 are using. Each unit will take approximately 2 weeks (6 lectures) to complete. Unit II will be primarily handled in the laboratory with problem practice sessions and relevant experiments.

- I. The Elements and the Periodic Table
  - A. Names and symbols of elements
  - B. Organizing and classifying elements
  - C. Associations of atoms in elements
  - D. Electronic Structure
  - E. Electron configurations
  - F. Periodic Properties
- II. Essentials of Stoichiometry
  - A. Measurements in the laboratory
    1. significant figures
    2. scientific notation
  - B. Atomic masses, the mole and molar masses

- C. Determination of empirical formula
  - D. Percent composition
- III. Chemical Compounds and Reactions
- A. Types of compounds - Ionic and molecular - recognition
  - B. Electronegativity
  - C. Oxidation numbers
  - D. Nomenclature of compounds
- IV. Structure of Covalent Species
- A. Octet Rule and deviations
  - B. Lewis Structures
  - C. Geometry of Species
  - D. Polarity
  - E. Environmental and biological compatibility
- V. Interparticle Forces and Solutions
- A. Homogeneous interparticle forces
    - 1. hydrogen Bonding
  - B. Solutions & solubility
    - 1. molarity
    - 2. calculations for solution preparation-including molarity and dilution
  - C. The solution process and heterogeneous interparticle forces
  - D. Interparticle forces in biological matter
  - E. Partitioning based on interparticle compatibility
  - F. Solutions & solubility
- VI. Fundamental energy concepts
- A. Strengths of bonds – enthalpy
  - B. States and location of matter – entropy and absolute temperature
  - C. Predicting chemical change – free energy
    - 1. redox reactions
    - 2. reduction potentials
    - 3. biochemical transformations
- VII. Acids, bases and equilibria
- A. Qualitative equilibrium ideas
  - B. Principle of LeChatelier and applications
  - C. Models of acidity/basicity
  - D. Bronsted-Lowry acids and bases
  - E. Lewis acids and bases
  - F. Weak acids and bases
    - 1. acid and base strength
    - 2. quantitation of acid and base strength
  - G. Carbon based acids and bases

## VIII. Chemical kinetics

- A. Factors effecting rates of chemical change
- B. Rate laws
- C. Molecularity
- D. Activation Energy
- E. Concepts in the Arrhenius Equation

### **Readings:**

You are responsible for reading the following sections of the textbook (*Chemistry, A Molecular Approach*, 1<sup>st</sup> edition, Nivaldo Tro)

All of Chapter 1

All of Chapter 2 (we will not cover mass spectrometry)

Chapter 3: 3.1-3.7

Chapter 4: 4.6-4.9

Chapter 7: 7.1-7.3 and 7.5-7.6

Chapter 8: 8.1-8.8 (we will not cover metallic character)

Chapter 9: 9.1-9.9 (including electronegativity)

Chapter 10: 10.1-10.7

Chapter 11: 11.1-11.3

Chapter 12: 12.1-12.3

Chapter 13: 13.1-13.3

Chapter 15: 15.1-15.8

Certain parts of 16.2 relating to calculating the pH of a buffer solution.

**Problems: You are responsible for completing all of the problems in the textbook that are related to the above reading sections. These problems will NOT be collected, but you may find problems on exams that are VERY similar to those in the textbook. Only the Mastering Chemistry problems will be graded for correctness. Stop by office hours to discuss any other problems!**