SYLLABUS
Chemistry 320  Quantitative Analysis
Fall Quarter 2013
MW 2:00 – 3:50 p.m.  ASRC 001

Instructor: Dr. Dean B. Atkinson
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Web: http://www.chem.pdx.edu/~atkinsdb/teach/320/ (and Desire2Learn)

Office Hours: MTW 9:30 - 10:30 a.m. or by appointment.

Grading: Homework worth 50 points (10 sets @ 5 points/set)
  Quizzes worth 50 points (best 5 x 10 points each)
  Midterm Exams (two - see schedule below) worth 100 points each
  Final Exam (Wed., December 11, 2013, 12:30 p.m.) worth 125 points
  Participation: OOCs / Clickers worth 75 points

Grades are based on the total of the above categories. The following percentage scores will guarantee the letter grade shown, however I may choose to revise the breakpoints downward at my discretion (based on the curve) and differentiate (+’s and –‘s) within the letter grades: [(A) > 90%, (B) > 80%, (C) > 65%, (D) > 55%]

(The lecture schedule is below.)

THE TEXT – we’re using the Fundamentals of Analytical Chemistry by Skoog, West, Holler, and Crouch, but the 9th Edition just became available and that makes things more complicated. I’ve looked at some of it and it doesn’t seem vastly different than the last edition, so I’m happy to let you use the 8th Edition if you can get one. I realize this is an expensive text, but it is widely recognized to be one of the best and also is an excellent reference which will probably serve you well in your future career. And I’ve tried to come up with a couple of lower-cost options: 1) the 9th edition is available in the bookstore and from the publisher (go to http://login.cengagebrain.com/ and use this code E-HY7W3NYR9F7TP) in an etext version that comes with their online homework system OWL; and because I want you to have something to keep on your shelf after the class, this version also comes with a loose-leaf version of the part of the text that I cover, 2) Sapling learning (the company that sells the other online homework system) has a limited number of packages available here that are a used version of the 8th edition with a code for their online homework. The lectures are drawn fairly closely from the text (either version) to give you another resource for understanding the material. I think that a good study technique is to quickly read over the sections of the text are likely to be covered before the lecture and then to read it again more carefully and work through the examples at some point afterward. This will be especially true because we will be skipping around in the text and the reading is pretty extensive.

ONLINE HOMEWORK - as noted above is either OWLv2 from Cengage (go to http://login.cengagebrain.com/ and use this code E-HY7W3NYR9F7TP) or Sapling Learning. Which version of the text you buy will probably determine which homework you use, because buying OWL by itself is as expensive as buying it with the text, so if you have a text already
Sapling is the cheaper option. Both versions of the homework are graded on participation, meaning that you get the full five points for any set that you put a reasonable amount of effort in on. There are also no deadlines, meaning that you can do the assigned homework anytime you want, but you are well-advised to do ALL of the applicable homework before the exams! Because the homework grades are based on participation, you don’t have to fight the “getting exactly the answer the program expects” problem that some online homework tools have. I also try to set the answer tolerances “loose” enough that it will say you have the right answer, if you are doing the problem correctly. The big advantages of online homework are that there are more problems available, they can be customized to fit the way I teach, and you can repeat a problem with a different set of numbers, to be sure you “got it”. And it’s available to you anytime that you have access to a computer or other web device. Go ahead and register yourself and get rolling on the homework sets right away.

CLICKERS - a.k.a. a classroom response system, will allow you to provide me with feedback about your level of understanding during class, instead of just during tests and quizzes. The platform we’ll be using is iClicker: your first option is a physical device called the iClicker2 that you can buy from the bookstore or directly from iClicker.com (~$45) and hopefully will use in other classes (if you already have an iClicker 1 from a Biology or other class, it will work fine); your second option is an app called iClickerGO, the license for which comes in durations from 6 months (~$10) to five years that you can run on any device that can access the web. I’ll give you 1 point for every question you get correct and a half-point for any that you try, and you’ll find that it’s easy to get to the maximum of 40 points. You have to do one version or the other, but you can wait until the first day of class to hear more about the two options (software vs. hardware).

THE QUZZES will be administered weekly near the end of the class on Wednesdays, except on the days of the midterms, Oct. 23 and Nov. 20. They are simple qualitative checks (five multiple choice questions) that you are keeping up with the reading and lecture material. There will be eight quizzes, and the best five will count for your grade. If you miss class on a Wednesday, you use a drop (no make-ups).

THE MIDTERM will be in-class, 60 minute exams, followed by a ~45 minute debrief. I think this is an efficient use of time and also tends to decrease the nervous tension about performance. You will know immediately what the test was about, and – most likely – how well you did. You will be allowed to bring a one-page (one side of an 8.5 x 11 sheet of paper) set of “crib notes” with any information that you find useful to each of the midterms.

THE FINAL will be two hours in-class. In this case you may bring two pages of crib notes. Note the slight time change from our usual meeting slot. I provide previous year’s midterms and finals for you to study, but I do not provide keys. I encourage you to work together (face-to-face or online) to develop a consensus key and to bring me completed versions of the practice test (in office hours) so I can help you with problem areas.
Schedule (subject to change, except exam dates)
Reading marked with an asterisk * should be primarily review.

M Sept. 30 Introduction / Philosophy / Format / Lab / Statistics & Sampling
   *Reading: Ch.1, (2,3,4)*, 5
W Oct. 2 Random Error (Uncertainty) / Probability and Statistics - 1 / Quiz 1
   *Reading: Ch.6

M Oct. 7 Probability and Statistics – 2
   *Reading: Ch.6
W Oct. 9 Statistical Analysis of Data / Quiz 2
   *Reading: Ch. 7

   *Reading: Ch. 7
W Oct. 16 Review of Aqueous Solutions / Quiz 3
   *Reading: Ch.9*, 14*

M Oct. 21 Aqueous Solutions / Acid-Base Titrations
   *Reading: Ch.9*, 14*
W Oct. 23 MIDTERM EXAM & Debrief

M Oct. 28 Activity Concept
   *Reading: Ch.10
W Oct. 30 Intro to General Equilibrium Approach / Quiz 4
   *Reading: Ch.11

M Nov. 4 Applications of GEA
   *Reading: Ch.11/15
W Nov. 6 pH measurement / Potentiometric Titrations / More Complex Eq / Quiz 5
   *Reading: Ch.15

M Nov. 11 Veteran’s Day – University Closed
   *Reading: Ch.15
W Nov. 13 Polyprotic acids / Quiz 6
   *Reading: Ch.17

M Nov. 18 Complex Formation/EDTA Titrations
   *Reading: Ch. 9 (section 5), 12
W Nov. 20 MIDTERM EXAM & Debrief

M Nov. 25 Intro to Spectroscopy / Quantitative Spectrochemical Methods
   *Reading: Ch.12
W Nov. 27 Introduction to Chromatography/Gas Chromatography / Quiz 7
   *Reading: Ch.24
M Dec. 2  Liquid Chromatography, Electrophoresis
   Reading: Ch.30, 31
W Dec. 4  Review for Final / Quiz 8

Wednesday, Dec. 11  FINAL EXAM (12:30 – 2:20 p.m. - Note change from regular class time)