

SYLLABUS
Chemistry 320 Quantitative Analysis
Fall Quarter 2010
MW 2:00 – 3:50 p.m. Shattuck 212

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 weeks @ 5 points/week)
Quizzes worth **50 points** (best 5 x 10 points each)
Midterm Exams (two - see schedule below) worth **100 points** each
Final Exam (Wed., December 8, 2010, 12:30 p.m.) worth **150 points**
Participation Exercises / Evaluation worth **50 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 is Fundamentals of Analytical Chemistry 8th Edition by Skoog, West, Holler, and Crouch. I realize it 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. The lectures are drawn fairly closely from the text 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 which will 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 a bit in the text and the reading is pretty extensive.

THE HOMEWORK will be graded on effort (essentially – did you try to do it? – yes or no) and returned to you. Each week’s homework is due by the next Monday, except the last week, which you can turn in at the Final Exam. (If you know you are going to miss a Monday, turn it in to my mailbox the week before. If you get sick or something comes up, email me and let me know in advance.) Since I believe that the homework will be most useful to you if you do it as you go along, there will no points for late homework. I have no problem with students working together on homework, with the understanding that everyone will be doing their own work and comparisons will be used to verify the results. Not doing your own work will probably result in poor performance on the exams and thus carries its own penalty. The answers for most of the problems are in the back of the book and the solutions guide (separate book) is available.

THE QUIZZES will be administered weekly near the end of the class on Wednesdays, except on the days of the midterms, Oct. 20 and Nov. 17. 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, five of which will be counted. If you miss class on a Wednesday, you use a drop (no make-ups).

THE MIDTERMS 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” containing 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. If you remind me, I will provide last year’s midterms and final for you to study with about a week before the tests. (Without keys!)

Schedule (subject to change, except exam dates)

Reading marked with an asterisk * should be primarily review.

- M Sept. 27 Introduction / Philosophy / Format / Lab / Statistics & Sampling
Reading: Ch.1, (2,3,4)*, 5 *Homework:* 5-8 (a,c), 9 (a,c), 10 (a,c), 11 (a,c), 12 (a,c,e)
- W Sept. 29 Random Error (Uncertainty) / Probability and Statistics - 1 / **Quiz 1**
Reading: Ch.6, *Homework:* 6-7 (a,c), 8 (a,c)
- M Oct. 4 Probability and Statistics – 2
Reading: Ch.6, *Homework:* 6-13, 17, 19
- W Oct. 6 Statistical Analysis of Data / **Quiz 2**
Reading: Ch. 7, *Homework:* 7-4 (a,c,e), 7, 9
- M Oct. 11 Statistics, Data Evaluation and Decision Making / Chemistry!
Reading: Ch. 7, *Homework:* 7-11, 16, 31
- W Oct. 13 Review of Aqueous Solutions / **Quiz 3**
Reading: Ch.9*, 14* *Homework:* 9-7 (a,c), 20 (a,c,e,g), 26 (a,c)
- M Oct. 18 Aqueous Solutions / Acid-Base Titrations
Reading: Ch.9*, 14* *Homework:* 9-27, 29 14-38, 41 (c)
- W Oct. 20 **MIDTERM EXAM & Debrief**
- M Oct. 25 Activity Concept
Reading: Ch.10, *Homework* 14-44 (a,c), 10-3, 7 (a,c), 8 (a,c), 18 (optional, hard!)
- W Oct. 27 Intro to General Equilibrium Approach / **Quiz 4**
Reading: Ch.11, *Homework:* Sample Midterm Exam

- M Nov. 1 Applications of GEA
Reading: Ch.11/15 *Homework:* 11-4 (a,c), 5 (a,c)
- W Nov. 3 pH measurement / Potentiometric Titrations / More Complex Eq / **Quiz 5**
Reading: Ch.15 *Homework:* 15-2 (a,c,e,g), 6 (a,c,e,g), 10, 16
- M Nov. 8 Polyprotic acids
Reading: Ch.15 *Homework:* 15-27, 31 (a,c,e)
- W Nov. 10 Complex Formation/EDTA Titrations / **Quiz 6**
Reading: Ch.17, *Homework:* 17-13, 15 (a,c), 17, 19, 23, 29, 30, 33
- M Nov. 15 Gravimetric/Argentometric Methods
Reading: Ch. 9 (section 5), 12, *Homework:* 9-8 (a,b,c), 9 (a,b,c), 15, 10-12
- W Nov. 17 **MIDTERM EXAM & Debrief**
- M Nov. 22 Intro to Spectroscopy / Quantitative Spectrochemical Methods
Reading: Ch.12 *Homework:* 12-9 (a,c,e,i), 10, 18, 28, 34(optional, hard!)
- W Nov. 24 Introduction to Chromatography/Gas Chromatography / **Quiz 7**
Reading: Ch.24 *Homework:* 24-14 (a,c,e), 15 (a,c,e), 24, 27
- M Nov. 29 Liquid Chromatography, Electrophoresis
Reading: Ch.30, 31 *Homework:* 30-23, 25, 27, 29, 31, 31-21
- W Dec. 1 Review for Final / **Quiz 8**

Wednesday, Dec. 8 **FINAL EXAM** (12:30 – 2:20 p.m. - Note change from regular class time)