

**SYLLABUS**  
**Chemistry 320 Quantitative Analysis**  
**Summer Session 2016 MTWR 3:00 – 5:05 p.m.**  
**Room TBA (CLSB 1A001 atm)**

Instructor: Dr. Dean B. Atkinson (Dr. A. or Dean)

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Web: <http://www.chem.pdx.edu/~atkinsdb/teach/320/> and [Desire2Learn](#)

Office Hours: MTW 9:30 – 11:00 a.m. *or by appointment.*

Grading: Homework (online, explained below) worth **60 points**

Quizzes (Tuesdays, 10 points each) worth **40 points**

Weekly Exams (Thursdays, 50 points each) worth **150 points**

Final Exam (Thursday, July 14, 2016, 3:00 p.m.) worth **100 points**

Participation Exercises / Evaluation worth **50 points**

Grades are based on the total of the above categories with a maximum of 400 points possible.

The percentage scores below will guarantee the letter grade shown, but 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 near the bottom of this document.)**

**THE TEXT** is Analytical Chemistry 2.0 by David Harvey, an open-access textbook available via download at <http://collection.asdlib.org/>. {I tried Harris last year, after using Skoog, et al. for many years and found that all three texts are pretty similar, but the other two keep coming out in new editions that seem to have little difference other than rapidly growing cost. You could buy one of them if you are one of those people that just has to have a hardcopy book, or you could probably have Kinkos print off a hardcopy of Harvey for less money. I personally like using electronic media better now.} I have found that a good study technique is to quickly read over the sections of the text that will be covered **before** the lecture and then to read it again more carefully (and work through the example problems) at some point afterward. Harvey provides detailed answers for the example problems, so working through them will be very helpful.

**THE SAPLING LEARNING HOMEWORK** is available online and gets graded as you do it (and you can get hints as you go along). There will be deadlines each Wednesday night to make sure you do the applicable homework before the exams, but you should get on each part as we cover it in class. One concern students have raised in the past is the “getting exactly the answer the program expects” problem that some online homework tools have, so to mitigate that I’ve done two things: 1) I set the tolerances on the answers “loose” enough that you should get credit if you are doing the problem right; and 2) There are more problems (worth one point each) available than the maximum number of homework points you can get (60 points) so you can afford to miss some of them. The big advantages of Sapling are: there are a lot of good problems available, it’s not tied to a particular text, you can repeat a problem with a different set of

numbers, it provides instant feedback and hints, and it's available to you anytime via the web.

**Maybe(?) - CLICKERS** (aka 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 called **iClicker** and there are a few options for you to consider: 1) a physical device called the *iclicker2* that you can buy from the bookstore or directly from iclicker.com for \$55 that you hopefully would be able to use in other classes (Organic Chemistry, Biology, etc.); 2) an app called REEF, 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; or 3) if you already have the older *iclicker plus* from another course, it will work for most of the questions in this class. As of right now, the iclicker.com website is giving you the REEF app when you buy the iclicker2 so you can try both. I'll give you 1 point for every question you get correct and a half-point for any incorrect tries, and you'll find that it's easy to get to the maximum of 50 points that can be applied to the Participation grade category, if we decide to use them this summer.

**THE QUIZZES** are administered weekly on Tuesdays, usually near the end of the class. They are simple qualitative checks (five multiple choice questions) that you are keeping up with the reading and lecture material.

**THE WEEKLY EXAMS** are in-class, 45 minute exams, followed by a quick 15 minute debrief and then a normal lecture (or vice versa). This is an efficient use of time (critical because of the compressed summer format) 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 weekly exams.

**THE FINAL EXAM** is two hours in-class on the last day of class and will be comprehensive. In this case you may bring two pages of crib notes.

**SAMPLE** weekly tests and finals are available on D2L for you to study and I can provide more on request via email. I never provide answer keys, but you are encouraged to develop a consensus key with your classmates and I am happy to review worked versions of the sample exams during my office hours. This tends to be a very good way to finalize your studying for each of the exams, but to take maximum advantage you have to be proactive.

**DRC ACCOMODATIONS** should be identified via an email during the first week of the term, but I am eager to work with people to provide the best support we can for your learning. For testing accommodations, you are required to schedule all four tests to overlap with the testing in the lecture class; optimally during the first hour of the class period for the first three weeks, so you can attend the test debrief that follows the three weekly exams. You also have the option of scheduling testing times for the Tuesday quizzes (optimally right after class) or taking the quizzes in the lecture. It behooves you to schedule all of the times ASAP, if you are going to use the Testing center.

**Schedule (subject to change, except exams and due dates)**

Reading marked with an asterisk \* should be primarily review.

- M June 20 Introduction / Philosophy / Format / Lab / Statistics & Sampling  
*Reading:* Harvey Ch. **1, 2\*, 3**
- T June 21 Random Error (Uncertainty) / Probability and Statistics - 1 / **Quiz 1**  
*Reading:* Harvey Ch. **4**
- W June 22 Probability and Statistics – POGIL exercise
- R June 23 Statistics, Data Evaluation and Decision Making / **Weekly Exam 1**
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- M June 27 Aqueous Solutions / "Simple" Acid-Base Titrations  
*Reading:* Harvey Ch. **6a-f\***
- T June 28 Activity Concept / **Quiz 2**  
*Reading:* Harvey Ch. **9a,b\***
- W July 29 General Equilibrium Approach / POGIL exercise  
*Reading:* Harvey Ch. **6i**
- R July 30 Applications of GEA to Monoprotic acids / **Weekly Exam 2**  
*Reading:* Harvey Ch. **6g**
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- M July 4 Independence Day – University Closed
- T July 5 Multiprotic acid systems/ Potentiometric Titrations – POGIL exercise / **Quiz 3**  
*Reading:* Harvey Ch. **9c**
- W July 6 Complex Ions
- R July 7 EDTA Titrations / **Weekly Exam 3**
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- M July 11 Gravimetric/Argentometric Methods  
*Reading:* Harvey Ch. **8**
- T July 12 Intro to Spectroscopy / **Quiz 4**  
*Reading:* Harvey Ch. **10**
- W July 13 Quantitative Spectrochemical Methods  
*Reading:* Harvey Ch. **12**
- Thursday, July 14, 2016 **FINAL EXAM** (3:00 – 5:05 p.m.)