Chem 155 Homework #1 Due in class, *before the bell rings* on Mon. Jan. 14
No late homework will be accepted for any credit—see syllabus
Some of this material won't be covered until after the assignment is due. That is intentional.
Reading: Chapter 15
Problems:
Tips to do well in 155:

i) The problems each week are the ***minimum*** set to start you learning the material—it is expected that after working these problems you will be more proficient, and able to tackle even more difficult problems (in other words, the exam problems are usually harder than the homework). You should consider working additional problems such as *'ed problems in Oxtoby and problems from previous midterm exams to prepare for the exams.

ii) Throw out your solution manuals. Don't even look at them for the assigned problems. Even a peek will ruin the problem for you. Remember—you're learning to think as much as do chemistry: a good analogy to what even peeking at the answer key does to the learning process would be the athlete who wonders why they are not getting in shape by having someone drive them around the track.

1) List seven strong acids

2) List six strong bases

3)A) Find at least one solution to the following 2nd order equation using successive approximations (also known as iterations). The answer to within 1% is fine. Show your result after each step.

$$\frac{x^2}{.06 - x} = 2.14 \cdot 10^{-3}$$

3B) Find at least one solution to the following equation by graphing as described in Oxtoby appendix C (or by graphing with a calculator—if you follow the graphing calculator method you must provide two solutions and a sketch of the graph). The answer(s) to within 1% is fine.

$$x^2 \frac{(4.00 - x)}{(5.00 + x)} = 1.23$$

Chapter 15 Problems
15.1
15.2
15.9
15.15
15.27
15.39
15.43
15.48

15.50 – Also answer: Why might you want to avoid using this buffer in practice – *specifically what pH conditions could be very hazardous*? Use table 10.2 to select a suitable alternative.
15.52
15.67

1) If you have access to stock solutions of 1.00 M H_3PO_4, 1.00 M of HCl, and 1.00 M NaOH solution, (and distilled water of course), what volumes of each would you mix before diluting to a final volume of 2.00 L to prepare 2.00 L of pH 7.40 buffer with a final total concentration of 50 mM of phosphorous contains species (e.g. so that $[H_3PO_4]+ [H_2PO_4^-]+[HPO_4^{2-}]+[PO_4^{3-}] = 50$ mM)