

“What should I know already?”

Many students mistakenly believe that Chem 101A is an introductory course, one that can be taken without having taken any chemistry courses in the past. This is not the case!

At a minimum, you should be familiar with the following information already. “Familiar” means that you should be able to answer questions about these topics with a minimum of review (no more than 10 minutes for any one topic). Do not expect to be able to spend time reviewing these basic concepts during Chem 101A: we will expect you to know, and use, this material from the very beginning of the course.

- The basic structure of the atom (protons/neutrons/electrons, how many, where they are).
- What a mole is, how to interconvert grams and moles, and the significance of Avogadro’s number.
- How to recognize whether a chemical equation is balanced, and how to balance a simple chemical equation.
- How to deal with molarity (using any two of the mass of solute, the volume of solution, and the molarity to calculate the third).
- How to use a balanced equation to interrelate masses and numbers of moles of the chemicals in the reaction. A typical example: “if you use 5 moles (or 5 grams) of chemical X, how many moles (or grams) of chemical Y will you make?”
- The difference between an ionic and a covalent bond, and the manner in which each type of bond is formed.
- How to write the formula of an ionic compound, if you know the formulas and charges on the constituent ions (for instance, “what is the formula of ammonium sulfide, given that ammonium ion is NH_4^+ and sulfide ion is S^{2-} ?”)

You should also know the names and symbols for common elements and ions. A representative list is on the back of this sheet. You need not know ALL of these, but you should know MOST of them. (We are also assuming that you are familiar with the significant figure rules for arithmetic calculations, although you can learn/review these during the early part of the semester.)

If you have not learned one or more of the above topics, you should seriously consider enrolling in Chem 40, even if you qualified for Chem 101A based on the placement test. “Passing” the placement test does NOT mean that you will pass Chem 101A. We set the placement test cutoff at the point where students who scored below the cutoff were guaranteed to fail Chem 101A: the test only screens out those students who have no realistic chance of passing the course.

If you know more chemistry than this, good for you! The more you already know, the easier you will find Chem 101A. We will cover topics such as gas laws, heats of reaction, atomic orbitals, Lewis dot structures, and so forth in detail in Chem 101A, but these are also covered in most introductory courses (including our Chem 40), and prior knowledge of them is very helpful.