Reading guide and suggested problems for Chapters 1 and 2:

Chapter 1: All sections (this is an easy read and gives a nice overview of Inorganic Chemistry) Section 1.2 has a nice discussion of the contrasts between inorganic and organic chemistry.

Chapter 2: Atomic Structure. This chapter builds a foundation for understanding atomic structure and particularly, how to think about the electrons in an atom. These concepts will guide our understanding of the structure of molecules in terms of bonding and the properties that these molecules possess.

Learning goals:
1) Understand what atomic orbitals are, including an understanding of quantum numbers. Be able to draw the orbitals on Cartesian coordinate axes.
2) Understand how electrons fill orbitals in atoms.
3) Be able to compare different species based on periodic trends.
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Suggested reading

2.1, 2.1.1, 2.1.2: review of historical development of atomic theory including the Bohr model for the atom. This provides a nice context for thinking about orbital energy levels (principal quantum number) and should be review from your general chemistry course.

2.2 and 2.2.1: The Schrödinger equation and Particle in a box. The discussion of the Schrödinger equation here is more complicated than we need for the purposes of this course, so do not panic if the equations intimidate you. The takeaway from these 2 sections should be:
1) Electrons can be represented as "wave functions," these wave functions are derived from the Schrödinger equation. Atomic orbitals (s,p,d,f…) come from wave functions.
2) Quantum numbers (n, l, m_l, and m_s) also come from wave functions
3) The square of a wave function represents the probability of finding an electron in a position.

2.2.2: Quantum numbers and atomic wavefunctions. You are responsible to know what the different quantum numbers are and what they represent. Known the shapes of the orbitals, what shading represents, and what nodes are.

2.2.3: The Aufbau principle. This section provides a review of how electrons fill orbitals. You are not responsible for calculations with the "coulombic energy of repulsion" and the "exchange energy," however the discussion of these in the text helps explain why electrons fill orbitals the way that they do.

2.2.4: Shielding. This section describes how inner shell electrons shield nuclear charge from the valence electrons and describes electronic configurations of different elements. You do not need to know Slater's rules, just understand the general concept of shielding. **Table 2.7** is particularly important, take note of the elements whose electronic configuration do not follow the simple order of orbital filling (marked by *).

2.3, 2.3.1, 2.3.2, 2.3.3: Periodic trends. These trends will help you later on in the course when trying to compare different transition metal complexes.

Suggested homework problems:
2.9, 2.10, 2.11: Do not do a,b,c. Instead, draw what these orbitals look like, placing them in the context of coordinate axes. Examples will be presented in class.

2.12ab, 2.13ab, 2.14ab, 2.15, 2.16, 2.17, 2.22, 2.23, 2.24, 2.26, 2.27, 2.28, 2.33, 2.34, 2.38, 2.42, 2.43, 2.44, 2.45