# Inorganic Chemistry

Chemistry 301 Fall 2005

The class will meet for lecture Tuesday and Thursday, 10:10 - 11:30 am in TL 302. Recitation classes will meet on Mondays (Section 001) 10:40-11:30 am BE 121 or Wednesdays (Section 002), 11:40 am- 12:30 pm, BE 415.
Grades will be based upon written homework assignments, a midterm examination, and a final examination. Since the homework assignments will be collected and scored, serving as a significant portion of your total score, they should **not** be treated as optional.

The texts: ***Molecular Symmetry and Group Theory,*** R. L. Carter, Wiley, 1998
***Advanced Inorganic Chemistry,*** Cotton, Wilkinson, Murillo, & Bochmann, Sixth Edition, Wiley Interscience, 1999
These texts will serve primarily as references for the material covered in class, and as resource materials for the weekly homework assignments.

The tentative list of topics to be discussed:

The behavior of an electron in the hydrogen atom, and how this behavior can be used to describe electrons in multi-electron atoms. Atomic orbitals.

How the individual behaviors of the electrons in an atom can be combined to give a "term" for the total behavior of an atom. Russell-Saunders coupling and term symbols.

Models for chemical bonding: the valence bond and molecular orbital models.

The simplifying nature of symmetry. Point groups and an introduction to group theory.

The application of group theory to molecular orbitals.

The application of group theory to vibrational states of polyatomic systems.

The chemistry of the transition metals:

Magnetic behavior: paramagnetism and ferromagnetism.

Electronic spectroscopy: Ligand field theory and the Tanabe-Sugano diagrams.

Some descriptive chemistry of transition metal complexes.