# GENERAL CHEMISTRY CHEM 1010 Fall, 2011

# Instructor: Dr. Todd A. Wells Physics, Room 205 Email: towells@du.edu

**Text**: Chemistry, 3rd Edition, Gilbert, Kirss, Foster, & Davies (2012) WW Norton & Company (available at the DU Bookstore).

Lectures: 9-9:50 am, MWF (Olin 205) Help Sessions: 9-9:50 am, T (Olin 205) Discussion: 9-9:50 am, Th (Olin 205) Office Hours: Announced first week in class

**Quizzes/Exams**: There will be 6 quizzes during the quarter, 3 hour exams, and a cumulative final exam. Quiz/Exam problems will be similar to the problems assigned as homework and the problems worked in class. If you miss an hour exam, then your final exam will be counted twice and replace the missed hour exam. With one exception, **THERE WILL BE NO MAKEUP EXAMS OR QUIZZES**. The only exception to the no-makeup policy will be for members of a University team or group, e.g. athletic team or music group, scheduled to be away from campus at the time of the exam/quiz. You must inform your instructor of this prior to the exam/quiz and make arrangements at that time for a makeup exam. If you miss an hour exam for any other reason, then the missed exam will be dropped and your final exam will be counted twice. Additionally, your 2 lowest quiz grades will be dropped. A missed quiz will count as one of your lowest.

**Discussion**: Discussion is an additional class meeting each week. It gives you an extra opportunity to ask questions about homework and the lectures. Each Discussion will include a ten minute quiz, except during the weeks immediately following the hour exams. The four best quizzes will count towards an overall discussion grade.

**Help Sessions**: Students who have not had chemistry in high school, or who are having difficulty in the course, are strongly encouraged to come to the help sessions. There you will have the opportunity to develop essential skills in an informal setting with a smaller group of students.

**Homework**: Each lecture has a group of homework problems assigned to it. The problems are taken from the Problems section at the end of each chapter or from Smartworks (online), and are chosen to prepare you for the quizzes/exams. If you understand and can do all the homework, you probably will do well on the quizzes/exams. There are many additional problems at the end of each chapter, grouped according to subject area. It is a good idea to work some of these extra problems in the areas where you are having difficulties. To get the most benefit from homework, you should **do the assignments on schedule**. While homework other than Smartworks will not be graded, it is important to keep up with these assignments!

Grading: Your final grade is based on a maximum of 350 points, distributed as follows:

Online homework:	100 points
Quizzes (25 points each):	100 points
Hour exams (100 points each):	300 points

The assignment of a letter grade (A, B, C, etc.) to a given numerical grade is a somewhat flexible procedure and depends on the overall class performance. Grades, however, will not be fitted to a statistical bell-shaped normal distribution. If the overall class performance is high, it is possible to have a distribution with predominantly A's and B's and relatively few lower grades.

## TOPICS COVERED (SCHEDULE WILL BE POSTED ON BLACKBOARD)

#### QUANTUM-MECHANICAL MODEL OF THE ATOM

Introduction / Atomic spectra Quantum-Mechanical Model Many-Electron Atoms

#### **CHEMICAL PERIODICITY**

Periodic Table Atomic Properties Chemical Reactivity

#### CHEMICAL BONDING AND MOLECULAR SHAPE

Ionic Bonding Covalent Bonding Lewis Structures VSEPR Theory Bond and Molecular Polarity Valence Bond Theory Types of Covalent Bonds Molecular Orbital Theory

#### **CHEMICAL REACTIONS**

Water as a Solvent Precipitation and Acid-Base Reactions Acids, bases and pH Oxidation-Reduction Reactions Balancing Redox Reactions Voltaic cells and cell potential

#### THERMOCHEMISTRY AND THERMODYNAMICS

Enthalpy Calorimetry Heats of Reaction Entropy Free Energy