

**GENERAL CHEMISTRY**  
**CHEM 1010**  
**Autumn, 2007**

**Instructor:** Dr. Todd A. Wells  
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**Text:** Chemistry, 4th Edition, Silberberg, 2006, McGraw-Hill

**Lectures:** 9-9:50 a.m., MWF, Olin 105

**Discussion:** 9-9:50 a.m., T, Olin 105

**Help Sessions:** 9-9:50 a.m., Th, Olin 105

**Exams:** There are three one-hour exams during the quarter, plus a two-hour cumulative final exam. Each exam counts 200 points. 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**. 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. You must inform your instructor of this prior to the exam and make arrangements at that time for a makeup exam.

If you take all three hour exams and your grade on the final exam is better than an hour exam grade, **then your final exam will be counted twice and replace your lowest hour exam grade.**

**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, and are chosen to prepare you for the hour exams. If you understand and can do all the homework, you probably will do well on the 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 is not collected, it is important to keep up with these assignments!

**Clickers:** Starting the second week of the quarter, clickers will be used to take attendance and to record your answers to questions that are presented during lecture. There are 24 days that clickers will be used. You are allowed 4 absences, so only your 20 best days will be used to determine your clicker grade. Each day will count 6 points, 3 points based on attendance and 3 points based on answers to questions. The questions that are asked may include questions from homework assignments.

**Grading:** Your final grade is based on a maximum of 1040 points, distributed as follows:

|   |                   |
|---|-------------------|
| <b>Hour exams (200 points each):</b>      | <b>600 points</b> |
| <b>Final exam:</b>                        | <b>200 points</b> |
| <b>Discussion Quizzes (four highest):</b> | <b>120 points</b> |
| <b>Clicker Questions:</b>                 | <b>120 points</b> |

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.

## LECTURE AND HOMEWORK SCHEDULE

| <b>DATE</b>                                 | <b>TOPIC</b>                               | <b>READING</b> | <b>HOMEWORK</b>                         |
|---|--|----------------|---|
| <b>WEEK 1</b>                               |  |                |   |
| <b>QUANTUM-MECHANICAL MODEL OF THE ATOM</b> |  |                |   |
| Sep 10                                      | Introduction / Atomic spectra              | 7.2            | 23, 27, 30, 32                          |
| 11  | No Help Session this Week                  |                |   |
| 12  | Quantum-Mechanical Model                   | 7.4            | 49, 54, 56, 57                          |
| 13  | Discussion, No Quiz                        |                |   |
| 14  | Many-Electron Atoms                        | 8.1-8.2        | 9, 10, 11, 14                           |
| <b>WEEK 2</b>                               |  |                |   |
| <b>CHEMICAL PERIODICITY</b>                 |  |                |   |
| 17  | Periodic Table                             | 8.3            | 25, 31, 34, 42                          |
| 18  | Help Session                               |                |   |
| 19  | Atomic Properties                          | 8.4            | 53, 54, 55, 56                          |
| 20  | Discussion, Quiz                           |                |   |
| 21  | Chemical Reactivity                        | 8.5            | 74, 83, 84, 87                          |
| <b>WEEK 3</b>                               |  |                |   |
| <b>CHEMICAL BONDING AND MOLECULAR SHAPE</b> |  |                |   |
| 24  | Ionic Bonding                              | 9.1-9.2        | 13, 20, 26, 29                          |
| 25  | Help Session                               |                |   |
| 26  | Covalent Bonding                           | 9.3            | 34, 38, 39, 40                          |
| 27  | Discussion, Quiz                           |                |   |
| 28  | <b>HOURLY EXAM I</b> (Covers Sep. 10 - 26) |                |   |
| <b>WEEK 4</b>                               |  |                |   |
| Oct 1                                       | Lewis Structures                           | 10.1           | 7, 8; 16, 17, 21, 22                    |
| 2   | Help Session                               |                |   |
| 3   | VSEPR Theory                               | 10.2           | 34, 37, 38, 39                          |
| 4   | Discussion, No Quiz                        |                |   |
| 5   | Bond and Molecular Polarity                | 9.5, 10.3      | 9: 57, 62, 66, 67<br>10: 40, 41, 56, 57 |
| <b>WEEK 5</b>                               |  |                |   |
| 8   | Valence Bond Theory                        | 11.1           | 7, 8, 12, 13                            |
| 9   | Help Session                               |                |   |
| 10  | Types of Covalent Bonds                    | 11.2           | 16, 17, 21, 24                          |
| 11  | Discussion, Quiz                           |                |   |
| 12  | Molecular Orbital Theory                   | 11.3           | 33, 34, 35, 36                          |
| <b>WEEK 6</b>                               |  |                |   |
| <b>CHEMICAL REACTIONS</b>                   |  |                |   |
| 15  | Water as a Solvent                         | 4.1            | 16, 21, 29, 30                          |

|   |  |           |                         |
|---|--|-----------|-------------------------|
| 16  | Help Session   |           |                         |
| 17  | Precipitation and Acid-Base Reactions  | 4.2-4.4   | 32, 35, 36, 49          |
| 18  | Discussion, Quiz   |           |                         |
| 19  | <b>HOURLY EXAM II</b> (Covers Oct. 1 - 17)<br><b>Last day for Automatic Withdraw</b> |           |                         |
| <b>WEEK 7</b>                             |  |           |                         |
| 22  | Acids, bases and pH  | 18.1-18.2 | 19, 21, 24, 30          |
| 23  | Help Session   |           |                         |
| 24  | Oxidation-Reduction Reactions  | 4.5-4.6   | 67, 70, 71, 76          |
| 25  | Discussion, No Quiz  |           |                         |
| 26  | Balancing Redox Reactions  | 21.1      | 4: 95, 96<br>21: 14, 15 |
| <b>WEEK 8</b>                             |  |           |                         |
| 29  | Voltaic cells and cell potential   | 21.2-21.3 | 30, 38, 39              |
| 30  | Help Session   |           |                         |
| <b>THERMOCHEMISTRY AND THERMODYNAMICS</b> |  |           |                         |
| 31  | Enthalpy   | 6.1-6.2   | 10, 17, 21, 25          |
| Nov 1                                     | Discussion, Quiz   |           |                         |
| 2   | Calorimetry  | 6.3-6.4   | 35, 36, 50, 51          |
| <b>WEEK 9</b>                             |  |           |                         |
| 5   | Heats of Reaction  | 6.5-6.6   | 63, 64, 75, 76          |
| 6   | Help Session   |           |                         |
| 7   | Heats of Reaction (continued)  | 9.4       | 48, 49, 90, 94          |
| 8   | Discussion, Quiz   |           |                         |
| 9   | <b>HOURLY EXAM III</b> (Covers Oct. 22 - Nov. 7)                                     |           |                         |
| <b>WEEK 10</b>                            |  |           |                         |
| 12  | Entropy  | 20.1      | 12, 16, 17, 25          |
| 13  | Help Session   |           |                         |
| 14  | Entropy (Continued) and Free energy  | 20.2-20.3 | 34, 43, 48              |
| 15  | Discussion, No Quiz  |           |                         |
| 16  | Free Energy  | 20.3      | 59, 62                  |
| 18  | <b>FINAL EXAM</b> (Cumulative)<br>Sunday, 8:00 - 9:50 a.m.                           |           |                         |