

# Department of Chemistry

## Brandon University

**18:170 – General Chemistry II (3 credit hours)**

**Winter Term, 2013**

**Course Instructor:**

Dr. A. C. J. Weber; Office: J. R. Brodie building, Room 4-12; Telephone: (204)571-7899, email: [webera@brandonu.ca](mailto:webera@brandonu.ca)

**Laboratory Instructor:**

Dr. T. Mengistu; Office: J. R. Brodie building, Room 4-16; Telephone: (204)727-9776, email: [mengistut@brandonu.ca](mailto:mengistut@brandonu.ca)

**Textbooks:**

'Chemistry: The Science in Context' by T. R. Gilbert, R. V. Kirss, N. Foster and G. Davies (9<sup>th</sup> edition), W. W. Norton & Company, 2012 (BU Bookstore).

General Chemistry II Laboratory Manual (18:170), Brandon University, Chemistry Department (can be purchased from the lab instructor).

**Lectures & Labs:**

Lecture: Brodie 1-52, Slot 1, Term 2

Labs: Brodie 4-24, Monday/Thursday/Friday at 1:40pm

**Course Outline:**

1. Gases (Chapter 6 and part of 10)  
Gas Laws. Dalton's Law. Graham's Law. Kinetic Molecular Theory of Gases. Non Ideal Gases. Intermolecular Forces.
2. Thermochemistry (Chapter 5)  
Heat and Work. First Law of Thermodynamics. Enthalpy. Hess' Law. Heat of Formation. Calorimetry.
3. Solutions (Chapter 11)  
Concentrations. Enthalpy of Solution. Solubility. Electrolytes. Colligative Properties. Colloids.
4. Reaction Kinetics (Chapter 15)

Rate Laws. Order of Reactions. Half Lives. Arrhenius Equation. Activation Energy.  
Reaction Mechanisms. Catalysis.

5. Chemical Equilibrium (Chapters 16 & 17)

Le Chatelier's Principle.  $K_p$  and  $K_c$ . Reaction Quotients. Heterogeneous Equilibria.  
Solubility Product. Precipitation and the Ion Product. Solubility and pH.

6. Thermodynamics Revisited (Chapter 14)

Entropy, Second and Third Laws of Thermodynamics. Gibbs' Free Energy. Free Energy and  
the Equilibrium Constant. Free Energy and Work.

7. Redox Reactions and Electrochemistry (Chapter 19)

Oxidation and Reduction. Half Reactions. Balancing Redox Equations. Electrolysis and  
Faraday's Laws. Voltaic Cells. Nernst Equation. Batteries.

**Marking Scheme:**

Term Test I	12.5%
Term Test II	12.5%
C. A. P. A Assignments	10%
Laboratory	20%
Final Exam	45%

**Grading:**

A+ 90-100

A 85-89

A- 80-84

B+ 76-79

B 72-75

B- 68-71

C+ 62-67

C 59-61

C- 55-58

D 50-54

F 0-49

NOTE:

If you achieve a mark of less than 10 out of 20 on the laboratory portion of the course, you will be given a grade of 'F' for the course. If you miss more than two labs, the laboratory portion of the course will be deemed to be incomplete and therefore you will be given a failing grade for the lab and for the course. **In other words, you must complete and pass the lab in order to pass the course.**