Chemistry 1010 Curriculum Outline

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Chemistry (2nd Canadian Edition) A Molecular Approach

The lecture and tutorial materials required for this course include:

- Mastering Chemistry Access Code (for all online assignments)
- Learning Catalytics Access Code (for tutorial sessions)

**Important note**: If you purchase a used book and are taking this course for the first time, be careful that you consider the pricing below since if you buy a used book, you will be required to purchase additionally a separate and new Mastering Chemistry access code at $66 (online purchase) followed by a Learning Catalytics access code at $12 US/6 months or $20 US/12 months (online purchase) for use in this course. Note that the Mastering Chemistry code and Learning Catalytics codes cannot be purchased used.

Course Materials available in bookstore as follows:

Loose Leaf Version + Mastering with ebook Code $120
Hardcover Version + Mastering with ebook Code $180
Note: The above options include Learning Catalytics codes as well.

Chemistry Textbook Bundles:
There are several special packages that can be purchased at the MUN bookstore which include textbooks from chemistry and certain physics and biology courses. If you are taking Chemistry and the additional courses as indicated below then consider these packages as better pricing then purchasing them individually. Note that these bundles include a loose leaf copy of each text and Mastering (with ebook) codes for each course.

Biology/Chemistry Bundle (Bio1001/Chem) $199.95
Physics/Chemistry Bundle (Phys1020/Chem) $199.95
*Biology/Physics/Chemistry Bundle* (Bio1001/Phys1020/Chem) $299.95
Note: The above options include Learning Catalytics codes as well.

There is also a Phys1050/Chem bundle for $199.95 and the books not only contain learning catalytics but Mastering Chemistry as well.

*On-line Codes Only (ie. student already has textbook) *

Mastering Chemistry (available at www.pearsonmylabandmastering.com only) $66
Learning Catalytics $12 US/6 months or $20 US/12 months (Online only)
Be careful about the choices you make with respect to the purchase of course materials since you don’t want to have to spend more than necessary. If you have questions, please feel free to speak with your instructor upon the start of the Fall 2017 semester.

Some of the material in the curriculum is listed as “Suggested Reading” from the textbook. These sections will not be covered to any great extent in class but you are responsible for the material in the “Suggested Reading” sections.

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1.1 Physical and Chemical Changes and Physical and Chemical Properties  p. 2
1.2 Energy: A fundamental Part of Physical and Chemical Change  p. 3
1.3 The Units of Measurement  
   The Standard Units  p. 4
   The Meter: A Measure of Length  p. 4
   The Kilogram: A Measure of Mass  p. 5
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**4.1 Chemistry of Cuisine** *(Suggested Reading)*

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**4.2 Writing and Balancing Chemical Equations**
- How to Write Balanced Chemical Equations
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**4.3 Solutions and Solubility**
- Electrolyte and Nonelectrolyte Solutions
- The Solubility of Ionic Compounds
- p. 107

**4.4 Precipitation Reactions**
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**4.5 Acid-Base Reactions**
- p. 111

**4.6 Oxidation-Reduction Reactions**
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**4.7 Reaction Stoichiometry: How Much is Produced?**
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**4.8 Limiting Reactant, Theoretical Yield and Percent Yield**
- Limiting Reactant, Theoretical Yield, and Percent Yield from the Initial Reactant Masses
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**4.9 Solution Concentration and Solution Stoichiometry**
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### Chapter 5: Gases

**5.1 Breathing: Putting Pressure to Work** *(Suggested Reading)*

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**5.2 Pressure: The Result of Molecular Collisions**
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**5.3 The Simple Gas Laws: Boyle’s law, Charles’s Law and Avogadro’s Law**
- Boyle’s Law: Volume and Pressure
- p. 154

**5.4 The Ideal Gas Law**

**5.5 Applications of the Ideal Gas Law: Molar Volume, Density, and Molar Mass of the Gas**
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**5.6 Mixtures of Gases and Partial Pressures**

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14.1 Fetal Hemoglobin (*Suggested Reading*)
14.2 The Concept of Dynamic Equilibrium
14.3 The Expression for the Equilibrium Constant
   - Relating $K_p$ and $K_c$
   - The Unitless Thermodynamic Equilibrium Constant
   - Heterogeneous Equilibria: Reactions Involving Solids and Liquids
14.4 The Equilibrium Constant ($K$)
   - Units of Equilibrium Constants
   - The Significance of the Equilibrium Constant
   - Relationships Between the Equilibrium Constant and the Chemical Equation
14.5 Calculating the Equilibrium Constant from measured Quantities
14.6 The Reaction Quotient: Predicting the Direction of Change
14.7 Finding Equilibrium Concentrations
   - Finding Partial Pressures or Concentrations at Equilibrium Amounts
     - When We Know the Equilibrium Constant and All but One of the Equilibrium Amounts of the Reactants and Products
   - Finding Equilibrium Concentrations When We Know the Equilibrium Constant and Initial Concentrations or Pressures
   - Simplifying Approximations in Working Equilibrium Problems
14.8 Le Chatelier’s Principle: How a System at Equilibrium Responds to Disturbances
   - The Effect of Changing the Amount of Reactant or Product on Equilibrium
   - The Effect of a Volume Change on Equilibrium
   - The Effect of Changing the Pressure by Adding an Inert Gas
   - The Effect of a Temperature Change on Equilibrium

*Chapter 15: Acids and Bases  p. 628*

15.1 Heartburn (*Suggested Reading*)
15.2 The Nature of Acids and Bases
15.3 Definitions of Acids and Bases
   - The Arrhenius Definition
   - The Bronsted-Lowry Definition
15.4 Acid Strength and the Acid Ionization Constant ($K_a$)
   - Strong Acids
   - Weak Acids
   - The Acid Ionization Constant ($K_a$)
15.5 Base Solutions
   - Strong Bases
   - Weak Bases
15.6 Autoionization of Water and pH
The pH Scale: A Way to Quantify Acidity and Basicity p. 641
pOH and Other p Scales p. 642

15.7 Finding $[\text{H}_3\text{O}^+]$, $[\text{OH}^-]$ and pH of Acid or Base Solutions p. 652
Strong Acids p. 644
Weak Acids p. 644
Percent Ionization of a Weak Acid (Not including p. 650-652) p. 649
Finding the $[\text{OH}^-]$ and pH of Basic Solutions p. 652

15.8 The Acid-Base Properties of Ions and Salts p. 654
Anions as Weak Bases p. 655
Cations as Weak Acids p. 659
Classifying Salt Solutions as Acidic, Basic, or Neutral p. 660

15.10 Lewis Acids and Bases p. 667
Molecules That Act as Lewis Acids p. 667
Cations that Act as Lewis Acids p. 668