

## Chemistry 1010 Curriculum Outline

**Nivaldo J. Tro Travis D. Fridgen Lawton E. Shaw**  
*Chemistry (3<sup>rd</sup> Canadian Edition) A Molecular Approach*

The lecture and tutorial materials required for this course include:

- *Chemistry (3<sup>rd</sup> Canadian Edition) A Molecular Approach* by Nivaldo J. Tro Travis D. Fridgen Lawton E. Shaw
- *Mastering Chemistry* Access Code (for all online knowledge checks, tests and exams)
- *Learning Catalytics* Access Code (for in-class participation and tutorial sessions)

### **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 biology and/or physics then consider these packages as they are better pricing than purchasing them individually.

**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 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.

### ***Chapter 1: Units of Measurement for Physical and Chemical Change p. 1***

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1.2	Energy: A fundamental Part of Physical and Chemical Change	p. 3
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	The Standard Units	p. 4
	The Meter: A Measure of Length	p. 4
	The Kilogram: A Measure of Mass	p. 5
	The Second: A Measure of Time	p. 5
	The Kelvin: A Measure of Temperature	p. 5
	SI Prefixes	p. 6
	Conversions Involving the SI Prefixes	p. 7
	Derived Units	p. 8
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	Counting Significant Figures	p. 13
	Exact Numbers	p. 14
	Significant Figures in Calculations	p. 15

	Rules for Calculations	p. 15
	Rules for Rounding	p. 16
	Precision and Accuracy	p. 17
1.5	Solving Chemical Problems	p. 19
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	Order-of- Magnitude Estimations	p. 20
	Problems Involving an Equation	p. 20

## **Chapter 2: Atoms and Elements p. 29**

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	The Law of Definite Proportions	p. 33
	The Law of Multiple Proportions	p. 33
	John Dalton and the Atomic Theory	p. 34
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	The Discovery of the Electron	p. 34
	The Discovery of the Nucleus	p. 36
	Protons, the Atomic Number, and Neutrons	p. 38
	Isotopes: When the Number of Neutrons Varies	p. 39
	Ions: Losing and Gaining Electrons	p. 40
2.5	Atomic Mass: The Average Mass of an Element's Atoms	p. 42
	Mass Spectrometry: Measuring the Mass of Atoms and Molecules	p. 43
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	The Mole: A Chemist's "Dozen"	p. 44
	Converting Between Number of Moles and Number of Atoms	p. 45
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	Ions and the Periodic Table	p. 50

## **Chapter 3: Molecules, Compounds, and Nomenclature p. 57**

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#### **Chapter 4: Chemical Reactions and Stoichiometry p. 101**

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	Solution Concentration	p. 132
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	Solution Stoichiometry	p. 137

#### **Chapter 5: Gases p. 149**

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5.2	Pressure: The Result of Molecular Collisions	p. 150
	Pressure Units	p. 151
	The Manometer: A way to Measure Pressure in the Laboratory	p. 152
5.3	The Simple Gas Laws: Boyle's law, Charles's Law and Avogadro's Law	p. 154

	Boyle's Law: Volume and Pressure	p. 154
	Charles's Law: Volume and Temperature	p. 156
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### **Chapter 14: Chemical Equilibrium p. 592**

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14.2	The Concept of Dynamic Equilibrium	p. 594
14.3	The Expression for the Equilibrium Constant	p. 596
	<i>Define <math>K_p</math> for reactions involving gases and <math>K_c</math> for reactions involving solutions. <b>Leave out the relationship between <math>K_p</math> and <math>K_c</math> and leave out the thermodynamic equilibrium constant.</b></i>	
	<i>Write <math>K_p</math> expressions for reactions involving gases and solids and/or liquids or and <math>K_c</math> expressions for reactions involving dissolved solutes and solids and/or liquids e.g. a solvent.</i>	

*Indicate that the amounts of solids and liquids have no effect on the equilibrium reached and hence are “left out” of  $K_p$  and  $K_c$  expressions.*

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