BRANDON UNIVERSITY

**18:090 INTRODUCTION TO CHEMISTRY**

# COURSE OUTLINE 2016-2017

**Instructors:** Mrs. Kathleen Nichol

Room 2-11 Brodie Bldg.

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**Time & Place** **Lectures:** Slot 11 (Tuesdays and Thursdays, 10:10 – 11:30 am)Room 4-34 Brodie Bldg.

**Lab Periods:** Thursday 12:00 noon – 2:30 pm ***OR***

Thursday 2:30 pm – 5:00 pm

Room 4-25 Brodie Bldg.

**Textbook:** 1. *Introductory Chemistry* by Nivaldo Tro: $193 new or $144.75 used.

2. Lab and Exercise Manual (available in office)

3. Lab locker deposit $ 12.00

**Credit:** 3 credit hours

**Marking scheme:** Chapter tests 20%

Midterm 15%

Laboratories 15%

Project 5%

Assignments 5%

Final exam 40%

100%

**Course Description:** Chemistry is the science that studies chemical substances and how they react, and attempts to explain why. Thus chemists are involved in many areas: study of the biochemistry of the human body; creation and manufacture of medicines; weed control; fertilizer creation and production; analysis of minerals for mining, soils for farming, water for consumption; pollution control, and more. This course is an introduction to this science.

Students may take this course in lieu of high school chemistry (grades 11 and 12) as the prerequisite for first year university chemistry (General Chemistry 18:160).

Students with a grade of 80% or better in 30S Chemistry may be permitted to enter the course in January (see the Instructor).

**Course Delivery:** The class periods will include lectures and time to try out new concepts.

**Tests:** On each chapter, students will be asked to complete and hand in an assigned worksheet and to write a test. The tentative test dates for the chapter tests are given on page 3.

**Labs:** For the laboratory periods, experiments have been scheduled that match the ideas being studied in the class. The purposes of the labs will be**:** to measure properties of materials such as density or melting points; to learn techniques that chemists use such as filtration, weighing, and titration; to observe chemical behaviour; and to interpret observations. The lab mark will be the average of all the labs, except two. Thus, up to two labs may be missed during the year.

Late labs are docked two marks. If more than one week late, the mark is zero.

The laboratory schedule has been given on page 4.

**Review periods:**  Review periods have been scheduled during the year. In the review period, you will be given time to work on a sheet of questions and problems. Handing in the completed sheet will give you the option of throwing out a low test mark, once per term.

**Test rewrite options:** The pass mark on the chapter tests is 65%. It is anticipated that you will pass each chapter test, but you will be given the option of writing a second test *on two tests of your choice per term,* if needed to improve your mark. The rewrites are different tests but cover the same topics.

**Project:** The project will involve independent reading on a topic of interest to you that involves chemistry, then writing of a brief report, and a short presentation in class.

**Moodle Site:** <http://wolf.brandonu.ca/moodle/> Course password is “absolutezero”.

**Grading System:**

**90% - 100% A+**

**85% - 89.9% A**

**80% - 84.9% A-**

**76% - 79.9% B+**

**70% - 75.9% B**

**65% - 69.9% C+**

**60% - 64.9% C**

**50% - 59.9% D**

**Less than 50% F**

**Learning Goals:**

\* read/see/hear/discuss/investigate/work through concepts so understand them

\* recall the main ideas

\* match a word to its definition

\* recognize the concept involved in a problem

\* recognize a technique that can be used to solve the problem

\* carry out the technique

\* check solution, by approximation or by reasonableness

\* work independently in lab

\* work in partners in lab

\* recognized and develop own learning style

\* enjoy chemistry

\* succeed

**INTRODUCTION TO CHEMISTRY SCHEDULE**

**Topic Chapter Tentative Test Date**

The Chemical World 1

Measurement and Problem Solving 2 September 27

Matter and Energy 3

Atoms and Elements 4 October 18

Molecules and Compounds 5

Chemical Composition 6 and 13.6 Molarity November 8

Chemical Reactions 7.

Quantities in Chemical Reactions 8 and 13.8 Solutions.

Gases 11 December 6

**December Progress Exam, Saturday, December 18, 9:00 a.m. – 12:00 noon**

Electrons in Atoms 9

and the Periodic Table January 17

Chemical Bonding: ionic 10

Chemical Bonding: covalent 10 January 31

Solution preparation 13

Solutions: the rest13

Reaction Rates 15A March 7

Equilibrium 15B

Acids and Bases 14 March 28

Oxidation and Reduction 16 April 6

**Plus *one* of the topics below:**

Radioactivity and Nuclear Chemistry 17

Organic Chemistry 18 April 6 or earlier

Biochemistry 19

**Final Examination, Thursday, April 13, 9:00 a.m. – 12:00 noon**

***Project Timeline:*** *Project introduction November 24*

*Project topic due December 6*

*Project references due January 5*

*Project due January 24*

*Project Presentations February 7 and 9*  **TENTATIVE LABORATORY SCHEDULE**

**Date Experiments**

September 8 No lab

September 15 WHMIS lecture and quiz *in the morning class*

September 15 2A **Lab Check-in** and Working in the Chemistry Laboratory

September 22 2B Determination of Density

September 29 2C Measurement and Significant Figures

October 6 3B Separating Components of a Mixture

October 13 Review

October 20 6A The Simplest Formula of a Compound

October 27 7A Chemical Reactions and Observations *and*

3C Separation of a Mixture by Paper Chromatography *and*

November 3 **Review**

November 10 **Fall Study Break**

November 17 8A Calculations with a Chemical Reaction

November 24 11A&B Properties of Gases *and* Calculation of Gas Constant

December 1 **Review**

January 5 9A The Periodic Table: The Chemistry of Elements within a Group

January 12 13B Effect of Solution Concentration on Freezing Point

January 19 10B Building models of covalent molecules

January 26 **Review**

February 2 13A Preparation of Solutions

February 9 13C Qualitative Analysis

February 16 15A Factors Affecting Reaction Rate

February 23 **Midterm Break**

March 2 **Review**

March 9 15B Chemical Equilibrium

March 16 14A Determination of Acetic Acid in Vinegar

March 23 **Review**

March 30 16A Oxidation-Reduction and Electrochemical Cells *and* **Lab Check-out**

April 6 **Tests on Chapter 16 and Choice Chapter**

This is a periodic table with videos and information on each element. It has a TED lesson on each one, as in a TED talk.

<http://ed.ted.com/periodic-videos>

This is Crash Course Chemistry, its run like the general chemistry/ AP chemistry.

<https://www.youtube.com/playlist?list=PL8dPuuaLjXtPHzzYuWy6fYEaX9mQQ8oGr>

This is periodic videos, its made at the university of Knottingham and is a mixture of fun reactions and videos about specific elements/ scientists.

<https://www.youtube.com/user/periodicvideos>

This is sixty symbols, it talks about physics and astronomy

<https://www.youtube.com/user/sixtysymbols>

Numberphile has videos on math and is actually very interesting, they have lots of videos on pi and some fun 'magic' which uses math

<https://www.youtube.com/user/numberphile>

This is the route to the website for the WHMIS training:

* Load the BU home page.
* Click on Services – near the top right.
* Click on MOODLE – near the middle of the left column.
* Click on 00 Communication websites.
* Click on Workplace Hazardous Materials Information System.
* Click “Yes”, then “continue”.
* The password is CHEMISTRY.
* View the two AV clips, on Labelling and MSDS.
* View the clip on Labels.
* Come prepared to do the quiz.