

Description

Chemistry is the study of the ways that the basic elements of our world interact with each other and the underlying principles of these interactions. God’s universe reflects His character and is worthy of study: a greater appreciation of His works “affords us new motives to acknowledge and adore the divine Author of things.” (Robert Boyle)

Our society and lifestyle is dependent on chemical industries, processes, and their applications. An understanding of basic Chemistry and its implications is important to anyone living in our modern society.

This course builds on the introduction to Chemistry provided by the grade 11 course (SCH3U). However, this course is much more theoretical in nature. It is designed to prepare students who are intending to study chemistry at the post-secondary level, or who require its content for future studies. Problem solving will be the central activity in this course. The course work is rigorous and, at times, mathematically intensive.

Outline of Course Content

Topic	Text reference
Unit 1: Structure and Properties	Ch. 3, 4
Unit 2: Organic Chemistry	Ch. 1,2
Unit 3: Chemical Systems and Equilibrium	Ch. 7,8
Unit 4: Energy Changes and Rates of Reaction	Ch. 5, 6
Unit 5: Electrochemistry	Ch. 9, 10

Text: *Chemistry 12* (Jenkins et al.) Nelson 2003
 Replacement cost if lost or damaged: \$125

Course Materials

- 3-ring binder with plenty of *loose-leaf lined paper and graph paper*
- A supply of pens, pencils; an eraser, a ruler, a calculator (non-graphing, multi-line)

Assessment As, Of and For Learning

- Assessment *FOR* learning are activities that help you learn course concepts while also informing you and your teacher of how you are progressing in the course – without counting towards your final grade (homework, quiz, observation/discussion, worksheet...).
- Assessment *AS* learning (eg. self and peer assessment) are activities that cause you to reflect on your own (or someone else’s) learning, and to act on your thinking to improve your learning.
- Assessment *OF* learning is the course work that demonstrates what you have learned in the course. Evidence of your achievement for evaluation is collected over time from three different sources – observations, conversations, and student products (tests, assignments, labs ...), and will make up 70% of your final grade. Your final exam will be worth 30%.

The approximate weightings of the learning categories in this course are shown in the table:

Category	K/U	T/I	C	A	Exam	Total
Weight	20	20	15	15	30	100

Student Expectations

Active class participation and regular completion of homework are important tools for success. Don't hesitate to ask questions (though I may not always have answers).

All members of this class will treat the classroom, each other, and the learning endeavor with respect. Here are some ways to ensure an orderly and successful classroom:

1. Be polite to each other and listen quietly when someone else is speaking.
2. Arrive in class on time, ready to work. Bring all essential materials to class, ready to be used (agenda, homework, textbook, notebook, writing supplies).
3. Keep a neat and organized notebook. Notes should have dates and should be in order. *You are responsible for getting any notes or handouts missed when you are absent.* Keep tests and quizzes to study from.
4. Complete your homework on time with proper headings (date, page). Homework will be assigned and checked regularly. ***If you do not complete your homework consistently, you will not be prepared for class and will be wasting your own time (and everyone else's time) taking this course.***

SCH4U – Course Overall Expectations (from *The Ontario Curriculum, Grades 11 and 12 Science, 2008*)

A. *Scientific Investigation Skills and Career Exploration* Throughout this course, students will:

1. demonstrate scientific investigation skills (related to both inquiry and research) in the four areas of skills (initiating and planning, performing and recording, analysing and interpreting, and communicating);
2. identify and describe careers related to the fields of science under study, and describe the contributions of scientists, including Canadians, to those fields.

B. *Organic Chemistry* By the end of this course, students will:

1. assess the social and environmental impact of organic compounds used in everyday life, and propose a course of action to reduce the use of compounds that are harmful to human health and the environment;
2. investigate organic compounds and organic chemical reactions, and use various methods to represent the compounds;
3. demonstrate an understanding of the structure, properties, and chemical behaviour of compounds within each class of organic compounds.

C. *Structure and Properties of Matter* By the end of this course, students will:

1. assess the benefits to society and evaluate the environmental impact of products and technologies that apply principles related to the structure and properties of matter;
2. investigate the molecular shapes and physical properties of various types of matter;
3. demonstrate an understanding of atomic structure and chemical bonding, and how they relate to the physical properties of ionic, molecular, covalent network, and metallic substances.

D. *Energy Changes and Rates of Reaction* By the end of this course, students will:

1. analyse technologies and chemical processes that are based on energy changes, and evaluate them in terms of their efficiency and their effects on the environment;
2. investigate and analyse energy changes and rates of reaction in physical and chemical processes; solve related problems;
3. demonstrate an understanding of energy changes and rates of reaction.

E. *Chemical Systems and Equilibrium* By the end of this course, students will:

1. analyse chemical equilibrium processes, and assess their impact on biological, biochemical, and technological systems;
2. investigate the qualitative and quantitative nature of chemical systems at equilibrium, and solve related problems;
3. demonstrate an understanding of the concept of dynamic equilibrium and the variables that cause shifts in the equilibrium of chemical systems.

F. *Electrochemistry* By the end of this course, students will:

1. analyse technologies and processes relating to electrochemistry, and their implications for society, health and safety, and the environment;
2. investigate oxidation-reduction reactions using a galvanic cell, and analyse electrochemical reactions in qualitative and quantitative terms;
3. demonstrate an understanding of the principles of oxidation-reduction reactions and applications of electrochemistry.