

Canterbury High School

Ottawa-Carleton District School Board

Science Department

Semester I – 2010 / 11 – Course Outline

Course Title: Grade 12 Chemistry, University Prep

Grade Level: 12

Course Code: SCH4U

Credit Value: 1.0

Prerequisite: SCH3U *above 65% recommended

Teachers: Mr. Burke, Mr. Smith

Course Overview: 110 hours

This course enables students to deepen their understanding of chemistry through the study of organic chemistry, energy changes and rates of reaction, chemical systems and equilibrium, electrochemistry, and atomic and molecular structure. Students will further develop problem solving and laboratory skills as they investigate chemical processes, at the same time refining their ability to communicate scientific information. Emphasis will be placed on the importance of chemistry in daily life, and on evaluating the impact of chemical technology on the environment.

Strands:

Course Expectations

Organic Chemistry

Overall Expectations

By the end of this course, students will:

- 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;
- investigate organic compounds and organic chemical reactions, and use various methods to represent the compounds;
- demonstrate an understanding of the structure, properties, and chemical behaviour of compounds within each class of organic compounds.

Energy Changes and Rates of Reaction

Overall Expectations

By the end of this course, students will:

- 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;
- investigate and analyse energy changes and rates of reaction in physical and chemical processes, and solve related problems;
- demonstrate an understanding of energy changes and rates of reaction.

Chemical Systems and Equilibrium

Overall Expectations

By the end of this course, students will:

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

Electrochemistry

Overall Expectations

By the end of this course, students will:

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

Structure and Properties

Overall Expectations

By the end of this course, students will:

- 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;
- investigate the molecular shapes and physical properties of various types of matter;
- 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.

Units of Study

In science, each strand covered will be a unit of study. The units of study are:

- **Organic Chemistry**
- **Energy Changes and Rates of Reaction**
- **Chemical Systems and Equilibrium**
- **Electrochemistry**
- **Structure and Properties**

See above section for more details.

Teaching Strategies

teacher demonstrations
laboratory experiments
multimedia
investigative research

small group work
student-teacher conferencing
written assignments
hands-on activities

Assessment and Evaluation Strategies

written tests
lab reports
observation (formal and informal)
homework checks and quizzes
summative assignment

rubrics
group presentations
discussion
research projects
exam

Evaluation Summary

Knowledge and Understanding	25 %
Thinking, Inquiry & Problem Solving	25 %
Communication	10 %
Making Connections	10 %
Summative Evaluation	10 %
Final Examination	20 %

Please refer to the achievement chart for science in the ministry curriculum documents for more information.

References

www.edu.gov.on.ca/eng/curriculum/secondary/science1112curr.pdf

Student Resources / Texts

Chemistry 12, McGraw-Hill Ryerson, replacement cost \$99.95 + tax and shipping