

Chemistry, Grade 12 University Preparation SCH 4U Course Outline

Victoria Park Collegiate Institute, TDSB
The Ontario Curriculum: The Ontario Curriculum: Science 2008
Grade 12, University Preparation, 1.0 credit

Prerequisites: Grade 11, University Preparation Chemistry

Assistant Curriculum Leaders:

S. Reichling, K. Thorne, Science Office room 221; extension 20095

Course Description

This course enables students to deepen their understanding of chemistry through the study of the properties of chemicals and chemical bonds; chemical reactions and quantitative relationships in those reactions; solutions and solubility; and atmospheric chemistry and the behaviour of gases. Students will further develop their analytical skills and investigate the qualitative and quantitative properties of matter, as well as the impact of some common chemical reactions on society and the environment.

Resources

Text: Nelson Chemistry 12

Note: Textbooks are lent to students and must be returned by the end of the semester.

Replacement cost if lost is \$125.00

Curriculum Expectations

Scientific Investigation and Career Exploration:

Throughout this course, students will:

- A1. 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);
- A2. identify and describe careers related to the fields of science under study, and describe the contributions of scientists, including Canadians, to those fields.

B. Electrochemistry

By the end of this course, students will:

- B1. analyse technologies and processes relating to electrochemistry, and their implications for society, health and safety, and the environment;
- B2. investigate oxidation-reduction reactions using a galvanic cell, and analyse electrochemical reactions in qualitative and quantitative terms;
- B3. demonstrate an understanding of the principles of oxidation-reduction reactions and the many practical applications of electrochemistry.

C. Structure and Properties

By the end of this course, students will:

- C1. 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;
- C2. investigate the molecular shapes and physical properties of various types of matter;
- C3. 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. Organic Chemistry

By the end of this course, students will:

- D1. 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;
- D2. investigate organic compounds and organic chemical reactions, and use various methods to represent the compounds;
- D3. demonstrate an understanding of the structure, properties, and chemical behaviour of compounds within each class of organic compounds.

E. Energy Changes and Rates of Reaction

By the end of this course, students will:

- E1. 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;
- E2. investigate and analyse energy changes and rates of reaction in p analyse chemical equilibrium processes, and assess their impact on biological, biochemical, and technological systems;
- E3. demonstrate an understanding of energy changes and rates of reaction.

F. Chemical Systems and Equilibrium

By the end of this course, students will:

- F1. analyse chemical equilibrium processes, and assess their impact on biological, biochemical, and technological systems;
- F2. investigate the qualitative and quantitative nature of chemical systems at equilibrium, and solve related problems;
- F3. demonstrate an understanding of the concept of dynamic equilibrium and the variables that cause shifts in the equilibrium of chemical systems.

Course Content

Unit	Timeline
Electrochemistry	20 hours
Structures and Properties	25 hours
Organic Chemistry	20 hours
Energy Changes and Rates of Reactions	20 hours
Chemical Systems and Equilibrium	25 hours

**Times listed are approximate. Order of instruction may vary.*

Course Evaluation

Learning Skills

Students will be assessed on the following Six Learning Skills;

Responsibility, Organization, Independent Work, Collaboration, Initiative, Self-Regulation

Teaching/Assessment and Evaluation Strategies

A range of instructional strategies will be used to address student needs. Some of these strategies include direct instruction, interactive instruction, experiential learning and independent study. Students are given opportunities to learn through assessment before evaluations.

Summative evaluation for this course is based on a final exam.

Achievement Chart

- **Knowledge and Understanding – K & U (30%)**
Assessment/Evaluation may include quizzes, homework checks, tests, problem sets, assignments, etc.
- **Communication – C (20%)**
Assessment/Evaluation may be based on laboratory reports, written reports, essays, oral presentations, in-class questions and answers, terminology, etc.
- **Thinking and Investigation – T& I (30%)**
Assessment/Evaluation may include scientific inquiry, technical skills, open ended test questions, concept maps, formulating questions, etc.
- **Application – A (20%)**
Assessment/Evaluation may include research, projects, debates, interviews, analyzing issues, assessing impacts and proposing courses of action, etc.

70% Grade on Course Work

Unit 1: Electrochemistry

Task	Achievement Chart Focus				Time of Assessment
	K&U	T/I	C	A	
Electrochemical Cell Investigation		x			
Electrochemistry Application Assignment		x	x	x	
Redox Reactions Quiz	x				
Unit Test	x	x	x		

Unit 2: Structures and Properties

Task	Achievement Chart Focus				Time of Assessment
	K&U	T/I	C	A	
Bonding Investigation		x		x	
Structure & Properties Assignment	x	x	x	x	
Atomic Theory and Properties Quiz	x				
Unit Test	x	x	x		

Unit 3: Organic Chemistry

Task	Achievement Chart Focus				Time of Assessment
	K&U	T/I	C	A	
Organic Reactions Lab		x	x	x	
Organic Compounds Assignment		x	x	x	
Nomenclature Quiz	x				
Unit Test	x	x	x		

Unit 4: Energy Changes and Rates of Reaction

Task	Achievement Chart Focus				Time of Assessment
	K&U	T/I	C	A	
Hess's Law Investigation		X	X		
Rates Investigation		X		X	
Thermochemistry Quiz	X				
Unit Test	X	X	X		

Unit 5: Chemical Systems and Equilibrium

Task	Achievement Chart Focus				Time of Assessment
	K&U	T/I	C	A	
Equilibrium Investigation		X	X		
Acid-Base Titration		X	X	X	
Equilibrium Quiz	X				

** Above task list subject to changes. Many of the above tasks will include Higher Order Thinking Skills (HOTS).

**Lab and lab activities involve skills. Evaluation of labs and skills are done on those actually performed by the student. Lab materials are seldom available after the activity. Regular attendance is critical for participation in and evaluation of these labs and skills.

30% Grade Based on Common Course-Culminating Activities

All students will write a final exam during exam week at the end of the course. A doctor's note will be required for absences from culminating activities and exams. For more detail, please consult the Student Agenda.

Late Assignments/Missed Evaluations

5% per school day will be deducted for late assignments at the teacher's discretion. Missed tests or quizzes may result in a mark of zero if appropriate documentation is not provided. Chronic absences from evaluations may result in referral to administration.

Grade Reports throughout the Year

The grade for each term/reporting period is based on the evaluations that have been conducted to that point in the course. They will be based on the most consistent level of achievement to that time. The students' grades may change when all work is evaluated by the end of the course. An interim report will be sent home in October/March.

Midterm reports will be sent home with the students approximately half way through the semester.

Accommodations

Accommodations refer to the teaching strategies, supports, and/or services that are required in order for a student to access the curriculum and demonstrate learning. Students who have an IEP are entitled to the accommodations specified in their plans.

The following considerations apply to each of the units in this course: *Instructional and assessment activities must take into account the strengths, needs, learning expectations and accommodations as identified in the Individual Education Plan whether students are formally identified or not.* (Regulation 181/98)

Policies and Procedures

See the Victoria Park C.I. Student Agenda for additional details on School Policies on Homework, Attendance, Lateness, Missing and Late Assignments and Assessments, Course Modifications and Academic Honesty.