Ontario eSecondary School
Course Outline
2022-2023

Ministry of Education Course Title: Gr. 12 Chemistry, College Preparation	
Ministry Course Code: SCH4C	
Course Type: College Preparation	
Grade: 12	
Credit Value: 1.0	
Prerequisite(s): Science, Grade 10, Applied or Academic (SNC2P or SNC2D)	
Department: Science	
Course developed by: **Kristy Strybosch**	**Created August 30th, 2019**
Length: **One Semester**	**Hours:** **110**
This course has been developed based on the following Ministry documents: 1. *Science, The Ontario Curriculum, Grades 11 and 12*, 2008, (revised) 2. *Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools (2010)* 3. *Learning for All (2013)*	

COURSE DESCRIPTION/RATIONALE

This course enables students to develop an understanding of chemistry through the study of matter and qualitative analysis, organic chemistry, electrochemistry, chemical calculations, and chemistry as it relates to the quality of the environment. Students will use a variety of laboratory techniques, develop skills in data collection and scientific analysis, and communicate scientific information using appropriate terminology. Emphasis will be placed on the role of chemistry in daily life and the effects of technological applications and processes on society and the environment.

Prerequisite(s): Science, Grade 10, Applied or Academic (SNC2P or SNC2D)

OVERALL CURRICULUM EXPECTATIONS

Scientific Investigation Skills and Career Exploration

By the end of the course, students will:

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

Matter and Qualitative Analysis

By the end of this course, students will:

- evaluate the effects of chemical substances on the environment, and analyse practical applications of qualitative analysis of matter;
- investigate matter, using various methods of qualitative analysis;
- demonstrate an understanding of the basic principles of qualitative analysis of matter

Organic Chemistry

By the end of this course, students will:

- evaluate the impact on society, human health, and the environment of products made using organic compounds;
- investigate the physical and chemical properties of organic compounds, and analyse some common organic chemical reactions;
- demonstrate an understanding of the structure and the physical and chemical properties of organic compounds.

Electrochemistry

By the end of this course, students will:

- analyse technological applications or processes relating to oxidation-reduction reactions, and assess their impact on the environment;
- investigate the oxidation-reduction reaction that occurs in a galvanic cell;
- demonstrate an understanding of the concepts of oxidation and reduction, and the principles of oxidation-reduction reactions.

Chemical Calculations

By the end of this course, students will:

- analyse processes in the home, the workplace, or the environmental sector that use chemical quantities and calculations, and assess the importance of accuracy in chemical calculations;
- investigate chemical compounds and chemical reactions using appropriate techniques of quantitative analysis, and solve related problems;
- demonstrate an understanding of the mole concept and its quantitative relationships in chemical reactions.

Chemistry in the Environment

By the end of this course, students will:
evaluate the importance of government regulations, scientific analyses, and individual actions in improving air and water quality, and propose a personal plan of action to support these efforts;
investigate chemical reactions, using appropriate techniques of quantitative analysis;
demonstrate an understanding of chemical reactions that occur in the environment as a result of both natural processes and human activities.

COURSE CONTENT

Unit	*Length*
Unit 1: Matter and Qualitative Analysis	28.25 hours
Unit 2: Chemical Calculations	18.75 hours
Unit 3: Organic Chemistry	18.75 hours
Unit 4: Chemistry in the Environment	20.75 hours
Unit 5: Electrochemistry	8.5 hours
Unit 6: Summative Review	7.5 hours
	2 hour exam
	5.5 hour Culminating Task
Total	**110 Hours**

The students will experience a variety of activities:

Video presentations and technological aids with videos embedded to enrich the course content and clarify concepts and skills being studied.

Practice (formative) quizzes as a review for students with access to answers for timely feedback to help reinforce the concepts and skills being studied.

Inquiry activities that will allow students to develop/practice problem solving and critical thinking skills, as well as enrich the course content and clarify concepts and skills being studied.

Visuals and graphic organizers are a great way for students to demonstrate their knowledge of subject matter through graphic organizers, pictures, and texts.

Individual Activities

Individual activities allow the teacher to accommodate interests and needs and to access the progress of individual students. The teacher plays an important role in supporting these activities through the provision of ongoing feedback to the students, both orally and in writing. These activities include the following in the course:

Research is completed in an online environment and the use of using reliable sources/A.P.A. formatting is reinforced.

Individual assignments - the teacher can support the student in these activities with ongoing feedback.

Oral presentations are facilitated through the use of video conferencing and video recording.

Practical extension and application of knowledge helps students develop their own voice, and gives them the ability to make personal connections, and connections to the world throughout their course.

ASSESSMENT, EVALUATION, AND REPORTING

Assessment: The process of gathering information that accurately reflects how well a student is achieving the identified curriculum expectations. Teachers provide students with descriptive feedback that guides their efforts towards improved performance.

Evaluation: Assessment of Learning focuses on Evaluation which is the process of making a judgement about the quality of student work on the basis of established criteria over a limited, reasonable period of time.

Reporting: Involves communicating student achievement of the curriculum expectations and Learning Skills and Work Habits in the form of marks and comments as determined by the teacher's use of professional judgement.

STRATEGIES FOR ASSESSMENT

Assessment practices can nurture students' sense of progress and competency and information instruction. Many diagnostic tools, e.g. checklists and inventories, are used at regular intervals throughout the units to encourage students' understanding of their current status as learners and to provide frequent and timely reviews of their progress.

Teachers are encouraged to share goals with students early in the course and to connect Unit learning experiences frequently and explicitly with big ideas, overall expectations, and performance tasks.

Students are also allowed a one-page (two sided) study sheet for the course. Teachers are recommended to encourage their students to create these sheets as a way of preparing for the tests.

ASSESSMENT ACTIVITIES

- ❑ Virtual lab assignments
- ❑ Practice (formative) worksheets
- ❑ Oral presentations
- ❑ Research projects
- ❑ Inquiry Assignments
- ❑ Tests & Exam

EVALUATION

The final grade will be determined as follows:

- ❑ Seventy percent of the grade will be based on evaluation conducted throughout the course. This portion of the grade should reflect the student's most consistent level of achievement throughout the course, although special consideration will be given to more recent evidence of achievement.
- ❑ Thirty percent of the grade will be based on a final evaluation administered at or towards the end of the course. This evaluation will be based on evidence from a combination of the following: an examination and a performance task, an essay, and/or another method of evaluation suitable to the course content. The final evaluation allows the student an opportunity to demonstrate comprehensive achievement of the overall expectations for the course.

  (*Growing Success: Assessment, Evaluation and Reporting in Ontario Schools*. Ontario Ministry of Education Publication, 2010 p.41)

Weightings	
Course Work	**70**
Knowledge/Understanding	21
Thinking/Inquiry	21
Communication	14
Application	14
Final	**30**
Performance Task	10
Final Exam	20

AFL/AAL/AOL Tracking sheet:

Unit 1: Matter and Qualitative Analysis

AAL	AFL	AOL
Lesson 1.3 Self reflection of videos	Lesson 1.1 Practice Questions	Lesson 1.8 Chemical Changes Gizmo
Lesson 1.4 Gizmos	Lesson 1.2 Physical Chemical Changes	Lesson 1.8 Chemical Changes Journal Entry
Lesson 1.5 Gizmos	Lesson 1.3 Periodic Tables Trends	Unit 1 Study Sheet
Lesson 1.7 Gizmos	Lesson 1.4 Practice Drawing Atoms and Making Ions	Unit 1 Test
Lesson 1.9 SCH4C Unit 1 Review	Lesson 1.4 Verification of Worksheets	Unit 1 Markerium (Isotope) Lab
	Lesson 1.5 Verification of Worksheets	
	Lesson 1.6 Verification of Worksheets	
	Lesson 1.7 Verification of Worksheets	

	Lesson 1.8 Verification of Worksheets	

Unit 2: Chemical Calculations

AAL	AFL	AOL
Lesson 2.3 Gizmo Exploration	Lesson 2.1 Verification of Worksheets	Unit 2 Study Sheet
Lesson 2.4 Gizmo Exploration	Lesson 2.1 Gizmo	Unit 2 Test
Lesson 2.5 Verification of review answers	Lesson 2.2 Verification of Worksheets	Mole Assignment
	Lesson 2.3 Verification of Worksheets	
	Lesson 2.4 Verification of Worksheets	

Unit 3: Organic Chemistry

AAL	AFL	AOL
Lesson 3.1 Practice questions	Lesson 3.2 Verification of Worksheets	Unit 3 study sheet
Lesson 3.2 Organic Quiz Generator	Lesson 3.5 Verification of Worksheets	Unit 3 Test
Lesson 3.3 Organic Quiz Generator		Organic Molecule Assignment
Lesson 3.4 Organic Quiz Generator		
Lesson 3.6 Verification of review answers		

Unit 4: Chemistry in the Environment

AAL	AFL	AOL
Lesson 4.7 Verification of review sheets	Lesson 4.1 Verification of Worksheets	Lesson 4.2 Video submission
	Lesson 4.2 Verification of Worksheets	Virtual Titration Lab
	Lesson 4.3 Verification of Worksheets	Unit 4 study sheet
	Lesson 4.4 Verification of Worksheets	Unit 4 Test
	Lesson 4.5 Verification of Worksheets	
	Lesson 4.6 Verification of Worksheets	

Unit 5: Electrochemistry

AAL	AFL	AOL
Lesson 5.3 Verification of review answers	Lesson 5.1 Verification of Worksheet	Unit 5 study sheet
	Lesson 5.2 Verification of Worksheets	Unit 5 Test

Finals

AOL
Summative Assignment
Final Exam