



Ontario eSecondary School Course Outline 2026-2027

Ministry of Education Course Title: Chemistry, University Preparation	
Ministry Course Code: SCH3U	
Course Type: University Preparation	
Grade: 11	
Credit Value: 1.0	
Prerequisite(s): SNC2D, Grade 10 Science, Academic	
Department: Science	
Course developed by: Quan Ly	Date: April 1st, 2021 Revised: August 1, 2026
Length: One Semester	Hours: 110
This course has been developed based on the following Ministry documents: 1. 1. <i>Science, The Ontario Curriculum, Grades 11 and 12</i>, 2008, (revised) 2. 2. <i>Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools</i> (2010) 3. <i>Learning for All</i> (2013)	

COURSE DESCRIPTION/RATIONALE

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.

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)

Matter, Chemical Trends, and Chemical Bonds

By the end of this course, students will:

- analyse the properties of commonly used chemical substances and their effects on human health and the environment, and propose ways to lessen their impact;
- investigate physical and chemical properties of elements and compounds, and use various methods to visually represent them;
- demonstrate an understanding of periodic trends in the periodic table and how elements combine to form chemical bonds.

Chemical Reactions

By the end of this course, students will:

- analyse chemical reactions used in a variety of applications, and assess their impact on society and the environment;
- investigate different types of chemical reactions;
- demonstrate an understanding of the different types of chemical reactions.

Quantities in Chemical Reactions

By the end of this course, students will:

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

Solutions and Solubility

By the end of this course, students will:

- analyse the origins and effects of water pollution, and a variety of economic, social, and environmental issues related to drinking water;
- investigate qualitative and quantitative properties of solutions, and solve related problems;
- demonstrate an understanding of qualitative and quantitative properties of solutions.

Gases and Atmospheric Chemistry

By the end of this course, students will:

- analyse the cumulative effects of human activities and technologies on air quality, and describe some Canadian initiatives to reduce air pollution, including ways to reduce their own carbon footprint;

- investigate gas laws that explain the behaviour of gases, and solve related problems;
- demonstrate an understanding of the laws that explain the behaviour of gases.

COURSE CONTENT

Unit Length

Unit 1: Matter, Chemical Trends, and Chemical Bonding	21 hours
Unit 2: Chemical Reactions	15 hours
Unit 3: Quantities in Chemical Reactions	20 hours
Unit 4: Solutions and Solubility	22.5 hours
Unit 5: Gases and Atmospheric Chemistry	22.5 hours
Unit 6: Course Review and Final Exam	9 hours

Total 110 Hours

UNIT DESCRIPTIONS

UNIT 1: MATTER, CHEMICAL TRENDS, AND CHEMICAL BONDING

In this unit, students will investigate physical and chemical properties of elements and compounds, and use various methods to visually represent them. Students will also demonstrate an understanding of periodic trends in the periodic table and how elements combine to form chemical bonds. Lastly, students will analyse the properties of commonly used chemical substances and their effects on human health and the environment, and propose ways to lessen their impact.

UNIT 2: CHEMICAL REACTIONS

In this unit, students will investigate different types of chemical reactions and demonstrate an understanding of the different types of chemical reactions. Lastly, students will analyse chemical reactions used in a variety of applications, and assess their impact on society and the environment.

UNIT 3: QUANTITIES IN CHEMICAL REACTIONS

In this unit, students will investigate quantitative relationships in chemical reactions, and solve related problems. Students will also demonstrate an understanding of the mole concept and its significance to the quantitative analysis of chemical reactions. Lastly, students will analyse processes in the home, the workplace, and the environmental sector that use chemical quantities and calculations, and assess the importance of quantitative accuracy in industrial chemical processes.

UNIT 4: SOLUTIONS AND SOLUBILITY

In this unit, students will demonstrate an understanding of qualitative and quantitative properties of solutions. Students will also investigate qualitative and quantitative properties of solutions, and solve related problems. Lastly, students will analyse the origins and effects of water pollution, and a variety of economic, social, and environmental issues related to drinking water.

UNIT 5: GASES AND ATMOSPHERIC CHEMISTRY

In this unit, students will demonstrate an understanding of the laws that explain the behaviour of gases. Students will also investigate gas laws that explain the behaviour of gases, and solve related problems. Lastly, students will analyse the cumulative effects of human activities and technologies on air quality, and describe some Canadian initiatives to reduce air pollution, including ways to reduce their own carbon footprint.

TEACHING AND LEARNING STRATEGIES

In this course, students will experience the following activities.

Participation activities are seven standardized, course-wide prompts (Teach the Teacher, Concept in Action, Spot the Error, Concept Connections, Take a Position, Claim/Support/Question, and a culminating Course Takeaways video) embedded at set points throughout the course. They build metacognitive engagement with unit concepts and contribute to the course's participation grade.

Presentations with embedded videos are utilized to outline concepts, explain theory with the use of examples and practice questions, and incorporate multi-media opportunities for students to learn more (e.g. online simulations, quizzes, etc.).

End of unit conversations and Poodlls are opportunities for students to express their ideas, problem solving, and thought processes with a teacher who provides timely feedback.

Reflection is an opportunity for students to look back at concepts and theories with new eyes, to relate theory to practice, and to align learning with their own values and beliefs.

Discussions with the instructor are facilitated through video conferencing, discussing the concepts and skills being studied. This enables two-way communication between the student and the instructor, to share ideas and ask questions in dialogue. This also helps to build a relationship between the student and instructor.

Instructor demonstrations (research skills, etc.) are opportunities for the instructor to lead a student through a concept or skill through video conferencing, videos, or emailing with the student.

Practical extension and application of knowledge are integrated throughout the course. The goal is to help students make connections between what they learn in the classroom and how they understand and relate to the world around them and their own lives. Learning becomes a dynamic opportunity for students to be more aware that their learning is all around them and enable them to create more meaning in their lives.

Individual activities/assignments assessments are completed individually at a student's own pace and are intended to expand and consolidate the learning in each lesson. Individual activities allow the teacher to accommodate interests and needs and to assess the progress of individual students. For this reason, students are encouraged to discuss IEPs (Individual Education Plans) with their teacher and to ask to modify assessments if they have a unique interest that they feel could be pursued in the assessment. The teacher plays an important role in supporting these activities by providing ongoing feedback to students, both orally and in writing.

Research is an opportunity to apply inquiry skills to a practical problem or question. Students perform research to gather information, evaluate quality sources, analyze findings, evaluate their analysis, and synthesize their findings into conclusions. Throughout, students apply both creative thinking and critical thinking. New questions are also developed to further learning.

Writing as a learning tool helps students to think critically about course material while grasping, organizing, and integrating prior knowledge with new concepts. Good communication skills are important both in and out of the classroom.

Virtual simulations are interactive websites that provide students with an opportunity to ask questions, explore hypotheses, relate variables, examine relationships, and make connections between theory and application in a safe environment that promotes intellectual risk taking and curiosity.

Virtual labs are interactive websites that provide students with an opportunity to follow a procedure to test hypotheses using scientific apparatus, gather and record observations, analyze observations using formula and relevant theory/concepts, and then formulate conclusions that relate hypotheses to analysis.

Diagrams are visual representations of scientific ideas and concepts. They provide another perspective to organize ideas. Visuals are thought to promote cognitive plasticity - meaning, they can help us change our minds or help us to remember an idea.

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Charts are visual representations of scientific ideas and concepts using math that support analysis. For example, you can have a pie chart that shows Canada's energy sources.

Tables involve organizing information in terms of categories (rows and columns). This helps us to understand the relationships between ideas and data, as well as highlight trends.

Drawings and schematics are scientific and engineering ideas explained visually. For example, an electric circuit can be explained using symbols, which makes it possible to communicate ideas universally, clearly, and succinctly.

Articles are examples of concepts and theories being discussed in the public realm and with respect to current events. They are snapshots not only of why scientific theories/concepts/applications are relevant but also provide a window into the broader context of scientific knowledge and understanding. Students learn through reading and analysis that science is deeply related to, and intertwined with, society and the diverse perspectives of lived experience.

Practice problems provide students with a scenario/problem to solve by applying concepts and skills learned in a context. This helps students to understand the relevance of their learning.

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.

Assessment & Evaluation at OES: Triangulation of Learning

In alignment with the Ontario Ministry of Education's *Growing Success* policy, student achievement across all high school courses at Ontario eSecondary School (OES) is evaluated through the **triangulation of evidence: observations, conversations, and student products**.

OES courses incorporate each of these evidence sources in a variety of ways to provide every student with equitable opportunities to demonstrate their learning:

- **Observations:** Collected through video recordings, interactive digital tools, learning logs, and synchronous task demonstrations.
- **Conversations:** Gathered via teacher-student conferences, oral defenses, virtual check-ins, and reflective feedback dialogues.
- **Products:** Demonstrated through major projects, essays, lab reports, performance tasks, and final assessments.

By evaluating a balanced variety of evidence, OES teachers apply professional judgment to ensure accurate, fair, and comprehensive assessment of each student's progress.

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.

Units conclude with unit tests and performance tasks (student designed inquiry projects and lab reports). 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. The teacher could also involve students in the discussion, modification, or creation of rubrics, and teach students to use rubrics as a learning tool that can support the writing process and practice.

ASSESSMENT ACTIVITIES

- You Try! Self-check problems
- Homework assignments
- Individual conference meetings
- Diagnostic quizzes
- e-Portfolio contributions (including oral and written submissions)
- Oral presentations (conferences)
- Research projects (STSE focused)
- Inquiry Projects
- Tests & Exam

EVALUATION

The final grade will be determined as follows:

☐ 65% 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.

25% of the grade will be based on a final evaluation administered at the end of the course. This evaluation will be based on a final written examination, comprehensive of the course. The final evaluation is an opportunity for the student to demonstrate comprehensive achievement of the overall expectations for the course.

10% of the grade will be based on the student's attendance and participation throughout the course, assessed according to Ministry criteria.

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

SCH3U Chemistry

Grade 11 · University

How the final mark is calculated from September 2026

**Term Work Evaluations (65%)**

Evaluation Item	Description	Category	Weight
Unit 1 Nomenclature Quiz	Students will be evaluated on unit concepts and terms.	K	11
Unit 1 Test	All students must write the Unit Test for <u>each Unit</u> .	KA	15
Unit 2 Types of Reactions Quiz	Students will be evaluated on unit concepts and terms.	K	
Unit 2 Classifying Reactions Assignment	Students will extend and transfer their understanding of unit concepts by completing engaging assignments.	T, C,	
Unit 2 Lab	Two term Inquiry Labs will be completed	K, T, C, A	

Unit 2 Test	All students must write the Unit Test for each Unit.	K, T, C, A	
Unit 3 Limiting Reagents Assignment	Students will extend and transfer their understanding of unit concepts by completing engaging assignments.	T, C	15
Unit 3 STSE Assignment	Two STSE Projects will be completed	K, T, C, A	
Unit 3 Test	All students must write the Unit Test for each Unit.	K, A	
Unit 4 Solubility Curve Assignment	Students will extend and transfer their understanding of unit concepts by completing engaging assignments.	T, C	13

Unit 4 Test	All students must write the Unit Test for each Unit.	K, T, C, A	
Unit 4 Lab	Two term Inquiry Labs will be completed	K, T, C, A	
Unit 5 Gas law Quiz	Students will be evaluated on unit concepts and terms.	K	11
Unit 5 STSE Assignment	Two STSE Projects will be completed	T, C	
Unit 5 Test	All students must write the Unit Test for each Unit.	KA	

Final Evaluations (25%)

Evaluation Item	Description	Category	Weight
Final Exam	A final, written examination, covering all curriculum expectations for the course.	K, T, C, A	25

ATTENDANCE and PARTICIPATION (10%)

Evaluation Item	Description	Category	Weight
Attendance	Assessed according to the Ministry's attendance criteria (Growing Success, September 2026 update), based on the proportion of unexcused absences over the course.	N/A	5
Participation	Assessed according to the Ministry's participation criteria (Growing Success, September 2026 update), based on engagement in class discussions and activities throughout the course, including the standardized participation prompts (see Teaching and Learning Strategies).	N/A	5

AAL/AFL/AOL TRACKING SHEET

Unit 1: Matter, Chemical Trends, and Chemical Bonding

AAL	AFL	AOL
Isotopes Worksheet	Atomic Theory Chart	Nomenclature Quiz
Polarity of Bonds Worksheet	Periodic Trends	Unit 1 Test
Unit 1 Self Assessment	Testable Questions: Observation	
Teacher check in	Lab Report	
	Molecular Polarity Predictions	

	Intermolecular Forces	
	Unit 1 Review	

Unit 2: Chemical Reactions

AAL	AFL	AOL
Word and Chemical Equations Worksheet	Balancing Simulation	Classify Reactions Assignment
Synthesis and Decomposition Worksheet	Incomplete Combustion and Pollutants	Types of Reactions
Single Displacement Reactions Worksheet	Unit Review	Lab Investigation Simulation

Double Displacement Reactions	Word and Chemical Equations Practice	Unit 2 Test
Unit 2 Self Assessment		
End of Unit Check in: Conversation		

Unit 3: Quantities in Chemical Reactions

AAL	AFL	AOL
Mole Calculations Worksheet	Mole Quiz	Limiting Reagents Assignment
Mole Worksheet	Gizmo Quantities in Chemical Reactions	STSE Project: Observation
Percent Composition	Stoichiometry Gizmo	Unit 3 Test
Empirical and molecular formula worksheet	Limiting Reactants Gizmo	
Stoichiometry Practice	Unit 3 Review	
Limiting Reactants and Percent Yield Worksheet		
Limiting Reactants and Percent Yield Worksheet		
Unit 3 Self Assessment		
End of Unit Check in		

Unit 4: Solutions and Solubility

AAL	AFL	AOL
Concentration Worksheet	Solubility Temperature	Solubility Curve Assignment
Concentration and Dilution Worksheet	Acids and Bases Assignment	Lab Investigation
net Ionic Equations Worksheet	Properties and Bases Quiz	Unit 4 Test
Acids and Bases Worksheet	Case Study: Drugs in Drinking Water	
Neutralization Worksheet	Unit 4 Review	
Unit Self Assessment		
End of unit Check in		

Unit 5: Gases and Atmospheric Chemistry

AAL	AFL	AOL
Pressure Conversion Worksheet	Gizmos Activity	Gas Law Quiz
Boyle's Charles' and Gay-Lussac's Gas Laws	Unit 5 Review	STSE Project
Combined Case Law		Unit 5 Test
Dalton's Law of Partial Pressure		
Simulation and Questions		
Ideal Gas Laws Worksheet		
Gas Stoichiometry Worksheet		
Self Assessment		
Unit Check In: Conversation		

Unit 6: Course Review and Exam

AOL
Final Exam

CONSIDERATION FOR PROGRAM PLANNING

PLANNING PROGRAMS FOR STUDENTS WITH SPECIAL EDUCATION NEEDS

OES teachers are the key educators of students with special education needs and have a responsibility to help all students learn. Program planning for students with special education needs is guided by the principles set out in *Learning for All: A Guide to Effective Assessment and Instruction for All Students, Kindergarten to Grade 12* (2013): all students can succeed; each student has their own unique patterns of learning; successful instructional practices are founded on evidence-based research, tempered by experience; and universal design and differentiated instruction are effective and interconnected means of meeting the learning or productivity needs of any group of students. Where a student has an Individual Education Plan (IEP), the accommodations identified in the IEP — instructional, environmental, and assessment — are implemented within the course, and the online learning environment is adapted accordingly. The asynchronous structure of OES courses provides built-in flexibility that supports many common accommodations, including extended time for assignments and assessments, breaks as needed, access to assistive technology, and the ability to review instructional material multiple times.

PROGRAM CONSIDERATIONS FOR ENGLISH LANGUAGE LEARNERS

Ontario schools have some of the most linguistically diverse student populations in the world, and OES serves English language learners across Ontario and internationally. English language learners may be Canadian-born or newcomers; they may have experience of highly sophisticated educational systems or may have come from regions where access to formal schooling was limited. In planning this course, teachers consider the strengths and needs of English language learners and provide appropriate adaptations consistent with *English Language Learners / ESL and ELD Programs and Services: Policies and Procedures for Ontario Elementary and Secondary Schools, Kindergarten to Grade 12* (2007). Supports within the online environment include modification of instructional language without modification of curriculum expectations, use of visual and multimedia supports, opportunities to replay and review lesson content, extended time where appropriate, and teacher feedback that models academic English. Assessment accommodations, such as granting additional time and permitting the use of bilingual dictionaries, are provided where appropriate.

ENVIRONMENTAL EDUCATION

Consistent with *Acting Today, Shaping Tomorrow: A Policy Framework for Environmental Education in Ontario Schools* (2009) and *Environmental Education: Scope and Sequence of Expectations* (2017), environmental education is embedded across the curriculum rather than treated as a separate subject. Teachers help students acquire knowledge about the environment, develop skills to address environmental issues, and foster attitudes that motivate responsible environmental action. As an online school, OES also models environmental responsibility through paperless course delivery and the elimination of daily commuting. Environmental education is a natural fit in this course: students investigate the relationships between science, technology, society, and the environment, including topics such as sustainability, resource use, and the environmental impact of human activity, consistent with the STSE focus of the Ontario science curriculum.

EQUITY AND INCLUSIVE EDUCATION

This course is planned and delivered in accordance with Ontario's *Equity and Inclusive Education Strategy* (2009) and *Policy/Program Memorandum No. 119, Developing and Implementing Equity and Inclusive Education Policies in Ontario Schools* (2013). OES is committed to an inclusive learning environment in which all students feel welcomed, respected, and able to succeed, regardless of ancestry, culture, ethnicity, sex, gender identity, sexual orientation, disability, race, religion, or socio-economic status. In this course, teachers select learning materials that reflect the diversity of Ontario and the wider world, address bias in texts and resources where it arises, and ensure that assessment practices are fair and free of cultural assumptions. Because OES students learn from communities across Ontario, Quebec, and around the world, discussion activities and teacher feedback are moderated to maintain a respectful, harassment-free environment for all learners.

FINANCIAL LITERACY EDUCATION

In accordance with *A Sound Investment: Financial Literacy Education in Ontario Schools* (2010) and current Ministry direction on financial literacy, students are provided with opportunities to build the knowledge and skills needed to make informed financial decisions, understand their roles as consumers and citizens, and think critically about the economic forces that affect their lives. OES also supports students in meeting the Ministry's financial literacy graduation requirement, as described in the OES School Course Calendar. In this course, students consider the economic dimensions of scientific and technological choices, including cost-benefit analysis of technologies and the financial implications of decisions that affect health and the environment.

FIRST NATIONS, MÉTIS, AND INUIT EDUCATION

Program planning in this course aligns with the Ontario First Nation, Métis, and Inuit Education Policy Framework (2007), which supports improved outcomes for First Nations, Métis, and Inuit students and promotes awareness and understanding of Indigenous histories, cultures, perspectives, and contributions among all students. Where appropriate to the curriculum expectations, teachers incorporate Indigenous perspectives, authors, and content, and approach these topics with accuracy and respect, drawing on Ministry-recommended resources. All OES students benefit from opportunities to deepen their knowledge of the histories and contemporary realities of First Nations, Métis, and Inuit peoples, including the legacy of the residential school system and the Truth and Reconciliation Commission's Calls to Action related to education.

THE ROLE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY

Information and communications technology (ICT) is integral to every OES course: instruction, learning activities, assessment, and teacher-student communication all take place through the school's learning management system. ICT tools — including multimedia lessons, digital texts, simulations, video conferencing for proctored assessments, and word-processing and productivity software — extend and enrich instruction and allow students to collect, organize, and present their learning in a range of formats. Teachers help students develop digital citizenship skills, including responsible and ethical use of technology, critical evaluation of online sources, protection of personal information, and academic integrity in digital environments, consistent with OES's Acceptable Use, Academic Honesty, and Artificial Intelligence policies as published in the School Course Calendar.

CAREER EDUCATION

Consistent with *Creating Pathways to Success: An Education and Career/Life Planning Program for Ontario Schools* (2013), teachers support students in answering the four questions at the centre of education and career/life planning: Who am I? What are my opportunities? Who do I want to become? What is my plan for achieving my goals? Expectations in this course include many opportunities for students to apply their skills to work-related situations, explore educational and career options, and become self-directed learners. OES guidance staff support students in course selection, postsecondary application planning (including OUAC, CEGEP, and international pathways), and the development of individual pathways plans. This course supports pathways into health sciences, engineering, environmental science, research, technology, and the skilled trades, and career connections within scientific fields are highlighted throughout the course.

COOPERATIVE EDUCATION AND OTHER FORMS OF EXPERIENTIAL LEARNING

Planned learning experiences in the community, including job shadowing, work experience, and cooperative education, provide students with opportunities to see the relevance of their classroom learning, explore careers of interest, and develop essential workplace skills consistent with *The Ontario Curriculum, Grades 11 and 12: Cooperative Education* (2018). Students may earn up to two cooperative education credits toward their compulsory credit requirements for the Ontario Secondary School Diploma. Students interested in experiential learning opportunities related to this course are encouraged to contact OES guidance staff to discuss options available to them.

HEALTH AND SAFETY

Although OES students learn remotely, health and safety remain integral considerations in program planning. Teachers model and promote safe and healthy practices for online learning, including sound ergonomics, balanced screen time, regular breaks, and strategies that support positive mental health and well-being. OES maintains a safe and respectful virtual learning environment consistent with the school's codes of conduct, bullying prevention expectations, and privacy practices as published in the School Course Calendar, and students are provided with clear channels for reporting concerns to their teachers, guidance staff, or the Principal. Where the course includes hands-on, at-home investigations, students receive explicit safety instruction, use only safe household materials as directed, and are required to follow all stated precautions; virtual labs and simulations are used where hands-on activity would pose a risk in a home setting.

ACCOMMODATIONS

Accommodations will be based on meeting with parents, teachers, administration and external educational assessment reports. The following three types of accommodations may be provided:

- ☐ **Instructional accommodations:** such as changes in teaching strategies, including styles of presentation, methods of organization, or use of technology and multimedia.
- ☐ **Environmental accommodations:** such as preferential seating or special lighting.
- ☐ **Assessment accommodations:** such as allowing additional time to complete tests or assignments or permitting oral responses to test questions.

Other examples of modifications and aids, which may be used in this course, are:

- Provide step-by-step instructions.
- Help students create organizers for planning tasks.
- Allow students to report verbally using a voice or video recording
- Permit students a range of options for reporting tasks.
- Provide opportunities for enrichment.