INSTITUTE OF CANADIAN EDUCATION

Course Title: Chemistry, Grade 11, University Preparation (SCH3U)
Course Name: Chemistry
Course Code: SCH3U
Grade: 11
Course Type: University Preparation
Credit Value: 1.0
Prerequisite: SNC2D, Science, Grade 10, Academic
Curriculum Policy Document: *Science, The Ontario Curriculum, Grades 11 and 12* (2008, Revised)
Course Developer: Institute of Canadian Education
Department: Science
Head of Department: Sadiya Manjra
Development Date: 2025
Most Recent Revision Date: 2026

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.

Prerequisite: SNC2D, Science, Grade 10, Academic

COURSE EXPECTATIONS

Unit	Unit Titles and Descriptions	Time Allocated
1	**Matter, Chemical Trends, and Bonding** – Students examine atomic structure, periodic trends, properties of compounds, and chemical bonding, including safe and responsible chemical use.	21 hours
2	**Chemical Reactions** – Students investigate types of chemical reactions, predict reaction outcomes, and examine their applications and impacts on society and the environment.	22 hours
	Midterm Exams	**3 hours**
3	**Quantities in Chemical Reactions** – Students apply the mole concept and quantitative relationships to chemical reactions and reaction efficiency.	21 hours
4	**Solutions and Solubility** – Students explore the properties and concentrations of solutions, water quality, solubility, and issues related to water pollution.	20 hours
5	**Gases and Atmospheric Chemistry** – Students examine gas properties and atmospheric chemistry and evaluate human impacts on air quality and strategies for reducing pollution.	21 hours
Final	**Final Exam**	**2 hours**
	Total	**110 hours**

Overall Curriculum Expectations:

By the end of this course, students will:

A: Scientific Investigation Skills and Career Exploration

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)

B: Matter, Chemical Trends, and Chemical Bonds

B1. analyse the properties of commonly used chemical substances and their effects on human health and the environment, and propose ways to lessen their impact;
B2. investigate physical and chemical properties of elements and compounds, and use various methods to visually represent them;
B3. demonstrate an understanding of periodic trends in the periodic table and how elements combine to form chemical bonds.

C: Chemical Reactions

C1. analyse chemical reactions used in a variety of applications, and assess their impact on society and the environment;
C2. investigate different types of chemical reactions;
C3. demonstrate an understanding of the different types of chemical reactions.

D: Quantities in Chemical Reactions

D1. 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;
D2. investigate quantitative relationships in chemical reactions, and solve related problems;
D3. demonstrate an understanding of the mole concept and its significance to the quantitative analysis of chemical reactions.

E: Solutions and Solubility

E1. analyse the origins and effects of water pollution, and a variety of economic, social, and environmental issues related to drinking water;
E2. investigate qualitative and quantitative properties of solutions, and solve related problems;
E3. demonstrate an understanding of qualitative and quantitative properties of solutions.

F: Gases and Atmospheric Chemistry

F1. 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;
F2. investigate gas laws that explain the behaviour of gases, and solve related problems;
F3. demonstrate an understanding of the laws that explain the behaviour of gases.

TEACHING AND LEARNING STRATEGIES

Students will experience a variety of instructional approaches, including:

- **Participation Activities:** 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, building metacognitive engagement with unit concepts and contributing to the course's participation grade.
- **Discussions with the Instructor:** Facilitated through video conferencing, discussing the concepts and skills being studied, enabling two-way communication between the student and the instructor to share ideas and ask questions in dialogue, and helping to build a relationship between the student and instructor.
- **Instructor Demonstrations:** Opportunities for the instructor to lead a student through a concept or skill (research skills, etc.) through video conferencing, videos, or emailing with the student.
- **Practical Extension and Application of Knowledge:** Integrated throughout the course 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, enabling students to be more aware that their learning is all around them and to create more meaning in their lives.
- **Individual Activities/Assignments:** Assessments completed individually at a student's own pace, intended to expand and consolidate the learning in each lesson, allowing the teacher to accommodate interests and needs and assess the progress of individual students (students are encouraged to discuss IEPs with their teacher and ask to modify assessments for unique interests), with the teacher providing ongoing feedback both orally and in writing.
- **Research:** 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, applying both creative and critical thinking and developing new questions 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, as good communication skills are important both in and out of the classroom.
- **Diagrams:** Visual representations of scientific ideas and concepts that provide another perspective to organize ideas, promoting cognitive plasticity — helping us change our minds or remember an idea.
- **Graphics/Images:** Visual representations of ideas/concepts, thought to promote cognitive plasticity — helping us change our minds or remember an idea.
- **Charts:** Visual representations of scientific ideas and concepts using math that support analysis (e.g. a pie chart showing Canada's energy sources).
- **Tables:** Organizing information in terms of categories (rows and columns), helping us understand the relationships between ideas and data and highlight trends.
- **Drawings and Schematics:** Scientific and engineering ideas explained visually (e.g. an electric circuit explained using symbols, making it possible to communicate ideas universally, clearly, and succinctly).

- **Articles:** Examples of concepts and theories being discussed in the public realm and with respect to current events — snapshots of why scientific theories/concepts/applications are relevant, and a window into the broader context of scientific knowledge, showing 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, helping students understand the relevance of their learning.

Assessment Strategies

Students will be provided with numerous and varied opportunities to demonstrate the full extent of their achievement of the curriculum expectations, across all four categories of the Achievement Chart. Progress will be monitored on an on-going basis using a variety of assessment tools, including written work, formal testing, quizzes, teacher-student communication, discussion boards and chat rooms.

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

Evaluation

The final grade will be determined as follows (in accordance with Ministry of Education standards):

Term Work Based on evaluations conducted throughout the course.	65%
Final Evaluation A final evaluation in the form of a written exam.	20%
Attendance and Participation	15%

Final Evaluation Breakdown:

- 20% written exam

ATTENDANCE POLICY

Regular attendance and active engagement are important for student success. Attendance and participation are monitored through the school's Learning Management System (LMS).
All online credit courses at ICE are designed to meet or exceed the **minimum 110 hours of instructional time** required for a credit course.

Online instructional time and engagement are monitored through:

- **LMS Engagement:** Students are expected to log in regularly and actively participate in online learning activities. LMS activity records are used to monitor engagement.
- **Biweekly Check-Ins:** Students complete a brief check-in every two weeks to review their progress and engagement. Additional support may be provided when concerns are identified.
- **Post-Unit Quizzes:** Short formative quizzes are completed at the end of each unit to monitor student progress and pacing.
- **Discussion Forums:** Students participate in required unit discussions and peer activities. Participation is monitored based on completion and engagement.

Students are responsible for maintaining regular participation and completing required learning activities within the course schedule.

EVALUATION MODEL – 10% TOTAL ATTENDANCE AND ENGAGEMENT WEIGHT

Component	Weight	Quantifiable Metric	Criteria
Biweekly Check-In	3%	Completed every two weeks	Students completes the required check-in within the scheduled time frame.
Post-Unit Formative Quiz	4%	Completed after each unit	Student completes the formative quiz by the assigned deadline.
Discussion Forum Participation	3%	Required posts and responses	Student submits the required original response and completes assigned peer responses.

CONSIDERATION FOR PROGRAM PLANNING

PLANNING PROGRAMS FOR STUDENTS WITH SPECIAL EDUCATION NEEDS

OES teachers support all students, guided by the principles of *Learning for All* (2013). Where a student

has an IEP, its accommodations are implemented within the course, and the asynchronous online structure naturally supports extended time, breaks, assistive technology, and repeated review of material.

PROGRAM CONSIDERATIONS FOR ENGLISH LANGUAGE LEARNERS

OES serves a linguistically diverse population of English language learners, both Canadian-born and newcomers, and follows Ministry ESL/ELD policy in planning appropriate adaptations. Supports include modified instructional language without altering curriculum expectations, visual/multimedia aids, extended time, and accommodations such as bilingual dictionaries.

ENVIRONMENTAL EDUCATION

Consistent with Ministry environmental education policy, environmental education is embedded across the curriculum rather than taught separately, and OES also models environmental responsibility through paperless delivery and no daily commuting. This course's STSE focus naturally incorporates topics like sustainability, resource use, and the environmental impact of human activity.

EQUITY AND INCLUSIVE EDUCATION

The course is planned and delivered in line with Ontario's Equity and Inclusive Education Strategy and PPM No. 119, aiming for an inclusive environment where all students feel welcomed and able to succeed regardless of background. Teachers select diverse learning materials, address bias, and ensure fair, culturally unbiased assessment.

FINANCIAL LITERACY EDUCATION

In accordance with Ministry financial literacy policy, students build the knowledge and skills to make informed financial decisions and think critically about economic forces affecting their lives. The course also incorporates cost-benefit analysis of technologies and the financial implications of health- and environment-related decisions.

FIRST NATIONS, MÉTIS, AND INUIT EDUCATION

Program planning aligns with the Ontario First Nation, Métis, and Inuit Education Policy Framework, incorporating Indigenous perspectives, authors, and content where appropriate to curriculum expectations. Students also gain opportunities to learn about Indigenous histories and contemporary realities, including the residential school legacy and the TRC's Calls to Action.

THE ROLE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY

ICT is integral to every aspect of OES courses, from instruction and assessment to teacher-student communication, all delivered through the school's learning management system. Teachers also help students develop digital citizenship skills, including responsible technology use, source evaluation, and academic integrity online.

CAREER EDUCATION

Consistent with *Creating Pathways to Success*, the course helps students explore who they are, their opportunities, and their goals, with many work-related and career-exploration activities embedded throughout. OES guidance staff support course selection and postsecondary planning, and the course connects to pathways in health sciences, engineering, environmental science, research, technology, and skilled trades.

COOPERATIVE EDUCATION AND OTHER FORMS OF EXPERIENTIAL LEARNING

Experiences like job shadowing, work experience, and cooperative education let students see the relevance of classroom learning and explore careers, consistent with Ministry co-op policy; students can earn up to two co-op credits toward their OSSD. Interested students are encouraged to contact OES guidance staff to discuss available options.

HEALTH AND SAFETY

Despite remote learning, OES prioritizes health and safety by promoting sound ergonomics, balanced screen time, and mental well-being, within a safe, respectful virtual environment with clear channels for reporting concerns. For hands-on, at-home investigations, students receive explicit safety instruction and use only safe materials under stated precautions, with virtual labs/simulations substituted where risk would otherwise be present.

Required Software, Equipment, and Textbooks

Required Textbooks and Resources

- Ontario Grade 11 **Chemistry** textbook aligned with *The Ontario Curriculum, Grades 11 and 12*
- Teacher-provided worksheets, laboratory manuals, and practice problems
- Safety Data Sheets (SDS) and WHMIS reference materials
- Online instructional videos, simulations, and virtual lab resources

Digital Resources and Software

- Google Drive or equivalent platform for assignment submission and collaboration
- Internet access for research, simulations, and digital resources
- Microsoft Office Suite or equivalent (Word, PowerPoint, Excel)
- Online chemistry simulation tools (e.g., virtual labs, molecular modelling software)

Teacher Considerations

- Use of assistive technology where appropriate (e.g., text-to-speech, speech-to-text)
- Flexible formats for demonstrating learning (written, oral, visual, and digital)

- Accommodations and modifications provided in accordance with Individual Education Plans (IEPs) and Ministry guidelines

- Emphasis on laboratory safety and safe handling of chemicals

Tips for Success – SCH3U

Welcome to SCH3U: Chemistry!

This course will strengthen your **scientific inquiry, problem-solving, and laboratory skills**, while helping you understand how chemistry explains the world around you.

To succeed:

- Check announcements, calendars, and lab schedules regularly

- Ask questions early—especially before labs and tests

- Review concepts and practise calculations consistently

- Follow all laboratory safety procedures and come prepared

- Use teacher feedback to improve your understanding and skills

Plan for **1–2 hours of focused study per day**, including reviewing notes, completing practice problems, and preparing for labs. Staying organized and engaged will help you succeed in chemistry and prepare you for future science courses and postsecondary pathways.