INSTITUTE OF CANADIAN EDUCATION

Course Title: General Science, Grade 12, University / College Preparation (SNC4M)

Course Name: Science

Course Code: SNC4M

Grade: 12

Course Type: University / College Preparation

Credit Value: 1.0

Prerequisite: Science, Grade 10, Academic, or any Grade 11 university, university/college, or college preparation course in science

Curriculum Policy Document: Science, The Ontario Curriculum, Grades 11 and 12, 2008 (Revised);*Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools* (2010)

Course Developer: Institute of Canadian Education.

Department: Science

Head of Department: Sadiya Manjra

Development Date: 2025

Most Recent Revision Date: August 2026

Course Description

This course enables students, including those pursuing postsecondary programs outside the sciences, to increase their understanding of science and contemporary social and environmental issues in health-related fields. Students will explore a variety of medical technologies, pathogens and disease, nutritional science, public health issues, and biotechnology. The course focuses on the theoretical aspects of the topics under study and helps refine students' scientific investigation skills.

COURSE EXPECTATION

Unit	Title	Description	Time
1	Medical Technologies	Students explore diagnostic tools, treatments, laboratory techniques, and emerging medical technologies, including their benefits, limitations, and ethical considerations.	**21 Hours**
2	Pathogens and Disease	Students study pathogens, disease transmission, prevention, treatment, immunity, vaccines, antibiotics, and public health organizations through labs, case studies, and simulations.	**22 Hours**
3	Nutritional Science	Students examine food chemistry, macromolecules, enzymes, digestion, nutrients, energy, diet, and food additives through laboratory investigations and practical activities.	**23 Hours**
	MIDTERM EXAM	Midterm assessment of learning from Units 1–3.	**2 Hours**
4	Science and Public Health	Students examine epidemiology, public health programs, pandemic response, and the application of scientific research to health issues.	**20 Hours**
5	Biotechnology	Students explore biotechnology in medicine, agriculture, and industry, including DNA techniques, applications, ethical issues, and societal impacts.	**20 Hours**
	FINAL EXAM	Final assessment of course learning.	**2 Hours**
Total			**110 Hours**

Overall Curriculum Expectations:

Medical Technologies	
A1	Introduction to Medical Technology
A2	Cost Benefit Analysis of Various Technologies
A3	Play the Image Quiz
A4	Research: Recent Technologies
A5	Alternative Technologies
A6	Medical Technology: OLOGY Hospital - Diagnosis and Treatment
A7	Unit Test
Pathogens and Disease	
B1	Introduction to Pathogens and Disease
B2	Properties and Virulence of Various Bacteria Activity
B3	Life Cycles
B4	Immunity and the Role of Antibiotics
B5	Role of International Non-Government Agencies
B6	Medical Technology: OLOGY Hospital – Centre for Disease Control
Nutritional Science	
C1	Macromolecules
C2	Chemical Tests on Macromolecules
C3	Enzymes
C4	The Digestive System
C5	Nutrient Energy Content
C6	Costs and Benefits of the Use of Non-Nutrient Food Additives
C7	Review Quiz

C8	Medical Technology: OLOGY Hospital – Dietitian Unit
C9	Unit Test
Science and Public Health	
D1	Introduction to Science and Public Health
D2	Case Study: Effectiveness of a Public Health Program
D3	Research: Combating a Potential Pandemic
D4	Research: Have We Learned Anything?
D5	Research: Scientific Research and Technological Advances on Public Health
D6	Medical Technology: OLOGY Hospital – Public Health Unit
D7	Summative Activity: Research Paper
Biotechnology	
E1	Introduction to Biotechnology
E2	Issues Relating to Applications of Biotechnology
E3	DNA Electrophoresis
E4	Biotechnological Techniques in the Food and Agricultural Industries
E5	Who is coming to dinner?
E6	Biotechnology
E7	Review Quiz
E8	Unit Test
FINAL EXAM	

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 ACTIVITIES

- Simulations and laboratory activities
- Individual conference meetings
- Diagnostic tests and written tasks
- Completed templates and graphic organizers
- Reflections
- Oral presentations and active listening
- Unit and course evaluations

Final Grade

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.	25%
Attendance and Participation	10%

Final Examination Breakdown

- 25% 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.
- **Instructional Records:** The school maintains records of instructional time, attendance, and student 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 complete the required check-in within the scheduled time frame.
Post-Unit Formative Quiz	4%	Completed after each unit	Students complete the formative quiz by the assigned deadline.
Discussion Forum Participation	3%	Required posts and responses	Students submits the required original response and completes assigned peer responses.

CONSIDERATION FOR PROGRAM PLANNING

Planning Programs for Students with Special Education Needs
Program planning is guided by *Learning for All (2013)* and recognizes that all students can succeed and have unique learning needs. Where an IEP is in place, identified instructional, environmental, and assessment accommodations are implemented. The online learning environment provides flexibility through extended time, breaks, assistive technology, and opportunities to review materials.

English Language Learners
Teachers consider the strengths and needs of English language learners in accordance with Ontario ESL/ELD policies. Supports may include clear instructional language, visual and multimedia resources, opportunities to review lessons, extended time, bilingual dictionaries where appropriate, and feedback that develops academic English.

Environmental Education
Environmental education is integrated into learning through connections among science, technology, society, and the environment. Students consider sustainability, resource use, human impact, and responsible environmental practices. Online learning also supports environmentally responsible practices through reduced paper use.

Equity and Inclusive Education
The course promotes an inclusive, respectful, and equitable learning environment. Learning materials and activities reflect diverse cultures, perspectives, and experiences. Teachers address bias and ensure that learning and assessment practices are fair and inclusive.

Financial Literacy Education
Students develop financial decision-making skills by considering the economic aspects of scientific and technological choices, including costs, benefits, resources, and the financial impact of decisions affecting health and the environment.

First Nations, Métis, and Inuit Education
Where relevant to course expectations, teachers incorporate accurate and respectful First Nations, Métis, and Inuit perspectives, histories, cultures, contributions, and contemporary issues using appropriate Ministry resources.

The Role of Information and Communications Technology
ICT is integrated throughout the course through the learning management system, multimedia lessons, digital resources, simulations, online communication, and productivity tools. Students develop digital citizenship, responsible technology use, source evaluation, privacy awareness, and academic integrity.

Career Education
Students connect course learning to education, career, and life-planning opportunities. Activities may include career research, workplace applications, and exploration of pathways related to science, health, technology, environmental studies, research, and skilled trades.

Cooperative Education and Experiential Learning
Where available, students may connect classroom learning with experiential opportunities such as job shadowing, work experience, and cooperative education. These experiences help students explore careers and develop workplace skills.

Health and Safety
Health and safety are emphasized in both online and practical learning. Students are encouraged to maintain proper ergonomics, take regular breaks, manage screen time, and follow safe practices. For hands-on activities, students receive safety instructions and use only approved materials. Virtual labs and simulations are used when appropriate.

ACCOMMODATIONS

Accommodations are determined through collaboration among students, parents/guardians, teachers, administration, and relevant educational assessments. They may include:

- **Instructional:** Step-by-step instructions, varied teaching strategies, graphic organizers, multimedia, and assistive technology.
- **Environmental:** Flexible learning arrangements and appropriate environmental supports.
- **Assessment:** Extended time, alternative response formats, oral responses, and other IEP-identified accommodations.
- Providing reading materials in advance.
- Offering multiple options for reading and writing tasks.
- Supporting note-taking through key words, templates, or a scribe where appropriate.
- Providing enrichment and additional learning opportunities.

Required Software, Equipment, and Textbooks – SNC4M
Texts & Resources
- Grade 12 Science / General Science textbook (Ontario approved)
- Teacher-provided worksheets, inquiry packages, and lab manuals
- Supplementary readings: articles, videos, and online resources related to scientific concepts, technology, and applications

Digital Resources
- Google Drive (for storing, sharing, and submitting assignments)
- Microsoft Office / Google Workspace (Word, Excel, PowerPoint, or Google Docs/Sheets/Slides)
- Online science simulations and interactive platforms

Teacher Considerations
- Assistive technology: speech-to-text, text-to-speech software for students requiring accommodations
- Flexible submission formats: digital submissions, scanned handwritten work, or typed solutions depending on student needs

Tips for Success – SNC4M
Welcome to SNC4M: Grade 12 Science – University/College Preparation

Welcome! This course will strengthen your understanding of scientific concepts across biology, chemistry, physics, and environmental science. You will develop problem-solving, analytical, inquiry, and critical thinking skills, which are essential for success in postsecondary STEM programs and real-world applications.

Stay Organized & Informed

- Check announcements, course updates, and your email regularly for important information.
- Review the course calendar to track assignment due dates, lab submissions, and quizzes.
- Science concepts build on previous units — staying current ensures you understand new topics effectively.

Manage Your Time Effectively

- Plan for 1–2 hours of focused study each day.
- Break larger tasks (reading,practice questions, assignments) into smaller, manageable steps.
- Avoid last-minute preparation, particularly for tests, lab reports, and research activities.

Understand Expectations

- Carefully read instructions, rubrics, and evaluation criteria for all assignments and assessments.
- Use a checklist to ensure:
    - All questions and lab procedures are completed
    - Units, diagrams, and calculations are clearly shown
    - Work is submitted in the correct format and on time

Practice Consistently

- Science requires application, not memorization.
- Complete practice questions, review feedback from teachers, and revisit challenging concepts.
- Use simulations, videos, and guided examples provided in the course to reinforce learning.

Remember: This course is designed to help you think critically, conduct scientific investigations, analyze data, and explain natural phenomena using evidence and reasoning. Approach each activity thoughtfully, stay curious, and maintain confidence in your ability to learn and succeed.