



Ontario eSecondary School Course Outline 2026-2027

Ministry of Education Course Title: Introduction to Computer Science	
Ministry Course Code: ICS3U	
Course Type: University	
Grade: 11	
Credit Value: 1.0	
Prerequisite(s): None	
Department: Computer Studies	
Course developed by: Brad Strassburger	Date: December 1st, 2024 Revised: August 1, 2026
Length: One Semester	Hours: 110
This course has been developed based on the following Ministry documents: 1. <i>Technological Education (2009)</i> 2. <i>Growing Success: Assessment, Evaluation, and Reporting in Ontario Schools (2010)</i> 3. <i>Learning for All (2013)</i>	

COURSE DESCRIPTION/RATIONALE

This course introduces students to computer science. Students will design software independently and as part of a team, using industry-standard programming tools and applying the software development life-cycle model. They will also write and use subprograms within computer programs. Students will develop creative solutions for various types of problems as their understanding of the computing environment grows. They will also explore environmental and ergonomic issues, emerging research in computer science, and global career trends in computer-related fields.

OVERALL CURRICULUM EXPECTATIONS

A. Programming Concepts and Skills

By the end of this course, students will:

- A1. demonstrate the ability to use different data types, including one-dimensional arrays, in computer programs;
- A2. demonstrate the ability to use control structures and simple algorithms in computer programs;
- A3. demonstrate the ability to use subprograms within computer programs;
- A4. use proper code maintenance techniques and conventions when creating computer programs.

B. Software Development

By the end of this course, students will:

- B1. use a variety of problem-solving strategies to solve different types of problems independently and as part of a team;
- B2. design software solutions to meet a variety of challenges;
- B3. design algorithms according to specifications;
- B4. apply a software development life-cycle model to a software development project.

C. Computer Environment and Systems

By the end of this course, students will:

- C1. relate the specifications of computer components to user requirements;
- C2. use appropriate file maintenance practices to organize and safeguard data;
- C3. demonstrate an understanding of the software development process.

D. Topics in Computer Science

By the end of this course, students will:

- D1. describe policies on computer use that promote environmental stewardship and sustainability;
- D2. demonstrate an understanding of emerging areas of computer science research;
- D3. describe postsecondary education and career prospects related to computer studies.

COURSE CONTENT

<i>Unit</i>	<i>Length</i>
Unit 0: Welcome and Intro	1 hours
Unit 1: Topics in Computer Science	15 hours
Unit 2: Programming Basics	12 hours
Unit 3: Fundamental Concepts	20 hours
Unit 4: Advanced Topics	25 hours
Unit 5: VPython	20 hours
Unit 6: Final Task	15 hours
Final Exam	2 hours
Total	110 Hours

UNIT DESCRIPTIONS

Unit 0 - Welcome and Introduction

Students will learn about what the course is about, what they can expect from each unit, and an overview of the major assignments in the course.

Unit 1 - Topics in Computer Science

In this unit you will learn about a wide variety of topics in computer science. You will start by learning about computer hardware and where the technology may be going followed by looking at educational and career opportunities that are available in computer science. Lastly you will look at the basic construction of computer programs. Throughout this unit you will have questions to work on and quizzes that act as checkpoints for your learning, followed by two major assessments.

Unit 2 - Programming Basics

In this unit you will learn the basic concepts in computer programming. You will learn about the fundamental components that make up a computer program as well as look at approaches to troubleshooting when programs are not working properly. There will be a checkpoint programming assignment as well as a quiz to ensure your understanding. It is important that you complete all exercises to ensure that you fully understand and are able to apply concepts. You will finish the unit with a short programming assignment.

Unit 3- Fundamental Concepts

In this unit you will expand on the basic concepts to create more complex selections and optimize your code through counting structures and the building of function blocks. You will also learn how to make basic GUI interfaces that will be used for the next unit as well. There will be two check in points with a quiz and your first GUI program. The unit will conclude with a quiz and major program and a conference with your teacher.

Unit 4 - Advanced Topics

In this unit you will expand on the concepts that we have covered so far by including concepts in error trapping, and utilizing the built-in functions in various python libraries. We also look at lists and how they can be used and manipulated, as well as how they can be used for storage and reading external data. There will be two concept quizzes that will act as checkpoints for your understanding as well as two assignments in this unit.

Unit 5 - VPython

In this unit you will learn about the Visual Python programming extension and library. You will apply the concepts that you have learned in previous units including repetition and the use of functions. You will complete two assignments for this unit as well as two check-in assessments.

Unit 6 - Final Task

In this unit you will propose a final programming project that covers the major concepts learned in the course.

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.).

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.

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.

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. These assessments are not for marks.

- In assessment for learning (AFL), teachers provide students with descriptive feedback and coaching for improvement.
- In assessment as learning (AAL), teachers help students develop their capacity to be independent, autonomous learners who are able to set individual goals, monitor their own progress, determine next steps, and reflect on their thinking and learning.

Evaluation: Assessment of Learning (AOL) focuses on evaluation which is the process of making a judgment 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 judgment.

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

Assessments are an important part of the learning process. It is the intention that formative and summative assessments provide students with constructive feedback to help them grow in developing their skills. It is also important that students play an active role in monitoring their own learning and skills development through the use of formative activities. It is also important that students bring their own creativity to the unit summative assessments.

ASSESSMENT ACTIVITIES

- ☐ Diagnostic tests
- ☐ Completed templates and graphic organizers
- ☐ Presentations
- ☐ Programming Projects
- ☐ Quizzes
- ☐ End of unit conversations (Google Meets)

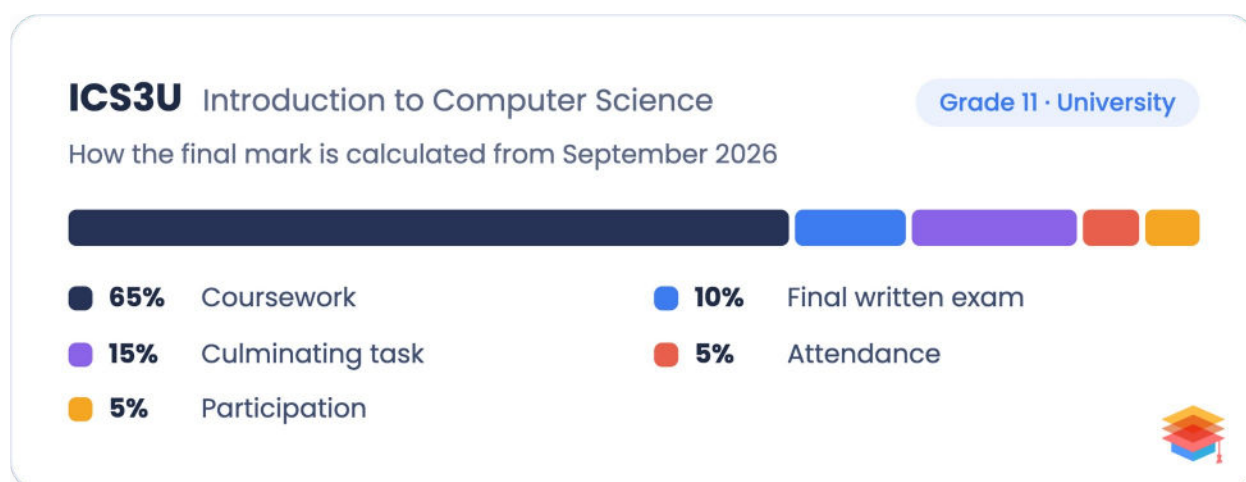
- ☐ Culminating Programming Project

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 evidence from a culminating task and a final written examination, both 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)



TERM WORK EVALUATIONS (65%)

Evaluation Item	Description	Category	Weight
Unit 1 Career Options Presentation	Students will explore career opportunities in computer technology fields.	K, T, C, A	15
Unit 1 Unit 1 Project (essay)	Students will write a brief essay with their opinion as to what the technology of the future will look like.	K, T, C, A	
Unit 2 Debugging Program	Students will look correct programs and explain the errors in the program	K, T, C, A	12.5
Unit 2 Unit 2 Project	Students will complete two programs that require the use of variables and mathematics.	K, T, C, A	

Unit 3 Unit 3 Quiz	Students will complete an online quiz	K, T, C, A	12.5
Unit 3 Unit 3 Project	Students will create a GUI and math functions to determine the mathematical values.	K, T, C, A	
Unit 4 Manipulating Lists Assignment	Students will use tools to manipulate and organize lists of data.	K, T, C, A	12.5
Unit 4 Unit 4 Project	Students will create a version of the classic board game MasterMind.	K, T, C, A	
Unit 5 Keyboard Input Program	Students will create a program that uses keyboard and mouse input.	K, T, C, A	12.5
Unit 5 Unit 5 Project	Students will use Visual Python to create a 3D version of the game Pong.	K, T, C, A	

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	10
Final Project	Final Programming Project	K, T, C, A	15

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: Topics in Computer Science

AAL	AFL	AOL
Computer Hardware Questions	History of Computers Quiz	Career Options Presentation: Observation
Computer Science vs Engineering Questions	Computers and the Environment Quiz	Unit 1 Project (essay): Conversation
Emerging Technologies Questions	Teacher Meeting About U1 Project: Conversation	
Post-Secondary Options Questions		
Software Development Life Cycle Questions		
Problem Solving and Planning Questions		

Unit 2: Programming Basics

AAL	AFL	AOL
Output Activity	Input and Variables Activity	Debugging Program
Input and Variables Exercises	Unit 2 Quiz	Unit 2 Project
Debugging Activity		
Selection Activity		

Unit 3: Fundamental Concepts

AAL	AFL	AOL
Advanced Selection Activity	Concepts Quiz #1	Unit 3 Quiz
User Defined Function Activity	Introduction to tkinter program	Unit 3 Project
Introduction to tkinter Activity	Teacher Meeting: Conversation	
Counted Repetition Activity		
Uncounted Repetition Activity		

Unit 4: Advanced Topics

AAL	AFL	AOL
Error Checking Activity	Concepts Quiz #2	Manipulating Lists Assignment
Built-In Functions Activity	Concepts Quiz #3	Unit 4 Project
Lists Activity		
Manipulating Lists Activity		
Search and Sort Activity		
Data Analysis Activity		
External Data Activity		

Unit 5: VPython

AAL	AFL	AOL
Introduction to VPython Activity	Bouncing Ball Activity	Unit 5 Project
Basic Movement Activity	Concepts Quiz #4	

Keyboard Input Activity: Observation		
Canvas and Clearing Objects Activity		

Unit 6: Final Tasks

AAL	AFL	AOL
	Project Proposal	Final Project
		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. In this course, students consider the environmental dimensions of computing and technology, including energy consumption, electronic waste, and the role of technology in addressing environmental challenges.

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 technology, including the costs of hardware, software, and services, licensing models, and the entrepreneurial opportunities associated with technological skills.

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 software development, information technology, computer engineering, digital media, and related technology fields, and these career connections 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. Students are taught safe and healthy practices for extended computer work, including sound ergonomics, appropriate breaks, and the safe handling of any equipment used in course activities.

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.
- ☐ **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 writing tasks.
- ☐ Allow students to report verbally to a scribe (teacher/ student) who can help in note taking.
- ☐ Permit students a range of options for reading and writing tasks.
- ☐ Where an activity requires reading, provide it in advance.
- ☐ Provide opportunities for enrichment.