

ICS3U - Introduction to Computer Science

GENERAL INFORMATION

Name of School: Rosedale Academy

Department: Mathematics and Computer Science

Course Developer: Asim Sayed – Rosedale Academy

Development Date: Nov 2016

Revision Date: TBD

Course Title: Introduction to Computer Science

Grade: 11

Course Type: University Preparation

Course Code: ICS3U

Credit Value: 1

Curriculum Policy Document: Computer Studies, The Ontario Curriculum, Grades 10 to 12, 2008

Department: Computer Studies

Prerequisite: None

COURSE DESCRIPTION

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.

PART OVERALL EXPECTATION / LEARNING OBJECTIVES

Unit 1: Computer Environments and Systems

1. Relate the specifications of computer components to user requirements;
2. Use appropriate file maintenance practices to organize and safeguard data;
3. Demonstrate an understanding of the software development process.

Unit 2: Programming Concepts and Skills

1. Demonstrate the ability to use different data types, including one-dimensional arrays, in computer programs;
2. Demonstrate the ability to use control structures and simple algorithms in computer programs;
3. Demonstrate the ability to use subprograms within computer programs;
4. Use proper code maintenance techniques and conventions when creating computer programs.

Unit 3: Software Development

1. Use a variety of problem-solving strategies to solve different types of problems independently and as part of a team;
2. Design software solutions to meet a variety of challenges;
3. Design algorithms according to specifications;
4. Apply a software development life-cycle model to a software development project.

Unit 4: Topics in Computer Science

1. Describe policies on computer use that promote environmental stewardship and sustainability;
2. Demonstrate an understanding of emerging areas of computer science research;
3. Describe postsecondary education and career prospects related to computer studies.

OUTLINE OF COURSE CONTENT

	Name of Unit	Time Allocated in Hours
Unit 1	Computer Environments and Systems	20 Hours
Unit 2	Programming Concepts and Skills	40 Hours
Midterm Report Cards		
Unit 3	Software Development	25 Hours
Unit 4	Topics in Computer Science	15 Hours
Unit 5	Final Project	10 Hours
Unit 6	Final Examination	
	TOTAL	110 Hours

TEACHING / LEARNING STRATEGIES

The strategies used are varied to meet the needs and the range of learning styles encountered and they include the following:

Articulate Learning Module	Brainstorming
Computer Assisted Learning	Decision Making
Direct Instruction	Demonstration
Animated Games	Discussion
Group Discussion	Estimating
iSpring Presentation / Animation	Independent Study
Online Graphing Software	Memorization
Problem-Based Learning	Model Analysis
Work and Task Sheet	Note Taking
Interactive Online Activity	Oral Explanation
	Peer Assessment
	Problem Solving
	Reasoning and Proving
	Self-Assessment

STRATEGIES FOR ASSESSMENT AND EVALUATION OF STUDENT PERFORMANCE

Evaluation in this course will be continuous throughout the year and will include a variety of evaluation methods. Assessment is embedded in the lessons throughout a unit under Check-Up Time.

Assessment as Learning	Assessment for Learning	Assessment of Learning
Student Product <ul style="list-style-type: none"> <input type="checkbox"/> Journals/Letters/Emails (checklist) <input type="checkbox"/> Learning Logs (anecdotal) <input type="checkbox"/> Peer Assessments <input type="checkbox"/> Practice Worksheets 	Student Product <ul style="list-style-type: none"> <input type="checkbox"/> Check-up Time Assessments <input type="checkbox"/> Journals/Letters/Emails (checklist) <input type="checkbox"/> Pre-Skills Checks (scale) <input type="checkbox"/> Quizzes (scale) <input type="checkbox"/> Graphic organizers (scale) <input type="checkbox"/> Peer feedback (anecdotal/checklist) <input type="checkbox"/> Reports <input type="checkbox"/> Practice Worksheets 	Student Product <ul style="list-style-type: none"> <input type="checkbox"/> Assignments <input type="checkbox"/> Journals/Letters/Emails (checklist) <input type="checkbox"/> Unit Tests (scale) <input type="checkbox"/> Final Exam <input type="checkbox"/> Case Studies <input type="checkbox"/> Presentations <input type="checkbox"/> Graphic organizers (scale)
Observation <ul style="list-style-type: none"> <input type="checkbox"/> Whole class discussions (anecdotal) <input type="checkbox"/> Self-proofreading (checklist) 	Observation <ul style="list-style-type: none"> <input type="checkbox"/> Class discussions (anecdotal) <input type="checkbox"/> Problem Solving 	Observation <ul style="list-style-type: none"> <input type="checkbox"/> Presentations
Conversation <ul style="list-style-type: none"> <input type="checkbox"/> Student teacher conferences <input type="checkbox"/> Small Group Discussions (checklist) <input type="checkbox"/> Pair work (checklist) <input type="checkbox"/> Skype meetings 	Conversation <ul style="list-style-type: none"> <input type="checkbox"/> Student teacher conferences <input type="checkbox"/> Small group discussions (checklist) <input type="checkbox"/> Pair work (anecdotal) <input type="checkbox"/> Peer-feedback (anecdotal) <input type="checkbox"/> Peer-editing (anecdotal) 	Conversation <ul style="list-style-type: none"> <input type="checkbox"/> Question and Answer Session (checklist) <input type="checkbox"/> Oral tests (scale) <input type="checkbox"/> Oral Presentation with question and answer session

FINAL GRADE

The percentage grade represents the quality of the students' overall achievement of the expectations for the course and reflects the corresponding achievement as described in the achievement chart for mathematics.

1. Term work will be 70% of the overall grade for the course;
2. The summative evaluations will be 30% of the overall grade, incorporating a final written examination and a final project.

Achievement Categories

Application:	25%	Knowledge and Understanding:	25%
Communication:	25%	Thinking/Inquiry:	25%

Achievement Chart

A Summary Description of Achievement in Each Percentage Grade Range and Corresponding Level of Achievement

Percentage Grade Range	Achievement Level	Summary Description
80–100%	Level 4	A very high to outstanding level of achievement. Achievement is above the provincial standard.
70–79%	Level 3	A high level of achievement. Achievement is at the provincial standard.
60–69%	Level 2	Moderate level of achievement. Achievement is below, but approaching the provincial standard.
50–59%	Level 1	A passable level of achievement. Achievement is below the provincial standard
Below 50%	Level R	Insufficient achievement of curriculum expectations. A credit will not be granted

RESOURCES REQUIRED BY THE STUDENT

ICS3U Online Course of Study
Net Beans Software (Java Coding)

PROGRAM PLANNING CONSIDERATION

Role of Technology in the Curriculum

Rosedale Academy courses leverage the power of information and communication technologies to provide rich, dynamic learning experiences. Students explore, evaluate and create concepts and works using a wide array of digital tools. They demonstrate their learning through text, video, voice and visual assignments that teach multi-literacy and media skills. Students also enhance their computer and technology skills in ways that are useful for their future academic and personal pursuits.

Teachers at Rosedale Academy get to know their learners, provide rich, descriptive feedback and assess student contributions and products AS, FOR and OF learning through digital technologies. They enable rapid feedback and communication at any time without borders in our global community.

Tool	Use	Benefit
Discussion forums	Whole class discussion (written)	Creates a record of each student's contributions
Group activities	Small group collaboration and discussion (written)	Encourages student participation; creates a record
Live Skype sessions	Teacher leads the lesson with students as a class	Observations of whole class and individual students
Databases	Students upload words, phrases, files, surveys, etc. to the database for peer assessment, presentation, or research	Student-centered data, peer assessment (as learning)
Peer Teaching	Students research a given topic and share their findings and opinions with other students.	Fosters discussion between students and allows for content to be learned and expressed from a student perspective
Journals	Small group discussions using problem solving	Improves students' critical inquiry, and reflective thinking skills about the concepts learned within the course
Learning Modules	Students explore content in an interactive manner with built-in assessments as they progress.	Students can navigate content at their own pace and assess their own learning along the way.
Computer Simulations	Individual or class exploration and visualization of concepts relating to the curriculum.	Allows hands-on exploration and investigation as an alternative learning strategy.

English as a Second Language

Rosedale Academy provides students with comprehensive ESL support to enhance their proficiency with the English language.

- All Rosedale Academy instructional materials and resources are designed with English Language Learners in mind. Online and face-to-face instructional resources make use of differentiated learning methods and carefully structured language. These resources support English language development as students are taking credit courses in all academic fields.
- Teachers at Rosedale Academy provide a variety of accommodations for English Language Learners. These accommodations include: extended time for tests and exams; chunking of assignments and tests; a safe space for asking questions; formative feedback; mini-lessons in spelling, sentence structure and grammar; and access to ESL resources and expert discussion.
- The self-paced delivery method of this course allows students to take the time that they require to engage in meaningful participation while still enjoying the enriching experience of working in an online global classroom.
- All teachers at Rosedale Academy are responsible for helping students to develop their ability to use English in academic courses.

Career Education

This course promotes skills effective for a variety of careers and informs students of some of the career opportunities where oral and written communication is considerable assets. Students will learn how to use English to inform audiences about ideas, persuade audiences to change their opinion or buy a product, and to formulate ideas. Students will also understand the importance of social media in their search for future education and career opportunities. Finally, this course also helps to prepare students for university application by providing a unit that helps them write a persuasive application essay. Beyond the immediate needs of the student, this also course focuses on demonstrating the value of English in jobs like business where clear communication is highly valued.

Academic Integrity

Students are expected to maintain high standards of honesty and academic integrity throughout their participation in all courses. This includes avoiding any instance of fraud, plagiarism and cheating. Rosedale Academy takes the following steps to ensure academic integrity:

- Students provide photo identification
- Course assignments include audio and video components
- Teachers Skype weekly with their classes
- Students are encouraged and supported to develop original work
- Exams are proctored by adults in trusted positions

When a teacher has reasonable grounds to believe that a student has violated these standards, the school principal will review the incident and, if needed, enforce disciplinary procedures. More information about *Academic Honesty* may be found in section 5.3 of the school calendar.

Late and Missed Assignment

Independent students have up to 12 months to complete a course. There are no set deadlines for course assignments. Students can proceed through each course at their own pace, but all course requirements must be completed prior to writing their final exam.

Cohort students follow a schedule in each course. This schedule specifies the due dates for all assignments. Students may request an extension if they are unable to meet a specific due date. Rosedale Academy reserves the right to deny any request. Late or missed assignments are not accepted without a valid reason.

ASSESSMENT CHART

Categories	50–59% (Level 1)	60–69% (Level 2)	70–79% (Level 3)	80–100% (Level 4)
Knowledge and Understanding – Subject-specific content acquired in each course (knowledge), and the comprehension of its meaning and significance (understanding)				
	The student:			
Knowledge of content (e.g., facts, technical terminology, definitions, procedures, standards)	demonstrates limited knowledge of content	demonstrates some knowledge of content	demonstrates considerable knowledge of content	demonstrates thorough knowledge of content
Understanding of content (e.g., concepts, principles, methodologies, use of tools)	demonstrates limited understanding of content	demonstrates some understanding of content	demonstrates considerable understanding of content	demonstrates thorough understanding of content
Thinking – The use of critical and creative thinking skills and/or processes				
	The student:			
Use of planning skills (e.g., focusing research, gathering information, selecting strategies, organizing a project)	uses planning skills with limited effectiveness	uses planning skills with some effectiveness	uses planning skills with considerable effectiveness	uses planning skills with a high degree of effectiveness
Use of processing skills (e.g., analysing, interpreting, assessing, reasoning, evaluating, integrating, synthesizing)	uses processing skills with limited effectiveness	uses processing skills with some effectiveness	uses processing skills with considerable effectiveness	uses processing skills with a high degree of effectiveness
Use of critical/creative thinking processes (e.g., evaluation of computer solutions, problem solving, decision making, detecting and correcting flaws, research)	uses critical/creative thinking processes with limited effectiveness	uses critical/creative thinking processes with some effectiveness	uses critical/creative thinking processes with considerable effectiveness	uses critical/creative thinking processes with a high degree of effectiveness
Communication – The conveying of meaning through various forms				
	The student:			
Expression and organization of ideas and information (e.g., clear expression, logical organization) in oral, visual, and written forms, including electronic forms (e.g., presentations, charts, graphs, tables, maps, models, web pages, reports)	expresses and organizes ideas and information with limited effectiveness	expresses and organizes ideas and information with some effectiveness	expresses and organizes ideas and information with considerable effectiveness	expresses and organizes ideas and information with a high degree of effectiveness

Categories	50–59% (Level 1)	60–69% (Level 2)	70–79% (Level 3)	80–100% (Level 4)
Communication <i>(continued)</i>				
	The student:			
Communication for different audiences <i>(e.g., peers, computer users, company supervisor) and purposes (e.g., to inform, to persuade) in oral, visual, and written forms, including electronic forms</i>	communicates for different audiences and purposes with limited effectiveness	communicates for different audiences and purposes with some effectiveness	communicates for different audiences and purposes with considerable effectiveness	communicates for different audiences and purposes with a high degree of effectiveness
Use of conventions, vocabulary, and terminology of the discipline in oral, visual, and written forms, including electronic forms	uses conventions, vocabulary, and terminology of the discipline with limited effectiveness	uses conventions, vocabulary, and terminology of the discipline with some effectiveness	uses conventions, vocabulary, and terminology of the discipline with considerable effectiveness	uses conventions, vocabulary, and terminology of the discipline with a high degree of effectiveness
Application – The use of knowledge and skills to make connections within and between various contexts				
	The student:			
Application of knowledge and skills <i>(e.g., concepts, procedures, processes, use of tools) in familiar contexts</i>	applies knowledge and skills in familiar contexts with limited effectiveness	applies knowledge and skills in familiar contexts with some effectiveness	applies knowledge and skills in familiar contexts with considerable effectiveness	applies knowledge and skills in familiar contexts with a high degree of effectiveness
Transfer of knowledge and skills <i>(e.g., choice of tools and software, ethical standards, concepts, procedures, technologies) to new contexts</i>	transfers knowledge and skills to new contexts with limited effectiveness	transfers knowledge and skills to new contexts with some effectiveness	transfers knowledge and skills to new contexts with considerable effectiveness	transfers knowledge and skills to new contexts with a high degree of effectiveness
Making connections within and between various contexts <i>(e.g., between computer studies and personal experiences, opportunities, social and global challenges and perspectives; between subjects and disciplines)</i>	makes connections within and between various contexts with limited effectiveness	makes connections within and between various contexts with some effectiveness	makes connections within and between various contexts with considerable effectiveness	makes connections within and between various contexts with a high degree of effectiveness

Note: A student whose achievement is below 50% at the end of a course will not obtain a credit for the course.