Introduction to Computer Science: Grade 12

Ministry: The Ontario Curriculum, Grades 10 to 12: Computer Studies, *2008*
course code: ICS4U1/7
credit value: 1 credit
prerequisite: ICS3U1/7
textbook: none

Description (as per *The Ontario Curriculum, Grades 10 to 12*)

This course enables students to further develop knowledge and skills in computer science. Students will use modular design principles to create complex and fully documented programs, according to industry standards. Student teams will manage a large software development project, from planning through to project review. Students will also analyze algorithms for effectiveness. They will investigate ethical issues in computing and further explore environmental issues, emerging technologies, areas of research in computer science, and careers in the field.

Additional topics to cover IB content focus on computing system fundamentals such as hardware and networking. There is also a case study on a computer-related topic assigned by the IBO. Questions on this case study will be on the IB exam.

By the end of this course, students will:
- demonstrate the ability to use different data types and expressions when creating computer programs
- describe and use modular programming concepts and principles in the creation of computer programs
- design and write algorithms and subprograms to solve a variety of problems
- use proper code maintenance techniques when creating computer programs
- demonstrate the ability to manage the software development process effectively, through all of its stages—planning, development, production, and closing
- apply standard project management techniques in the context of a student-managed team project
- demonstrate the ability to apply modular design concepts in computer programs
- analyze algorithms for their effectiveness in solving a problem
- assess strategies and initiatives that promote environmental stewardship with respect to the use of computers and related technologies
- analyze ethical issues and propose strategies to encourage ethical practices related to the use of computers
- analyze the impact of emerging computer technologies on society and the economy
- research and report on different areas of research in computer science, and careers related to computer science

Thinking. This is a rigorous course based on critical thinking and problem solving. Upon successful completion of this course, students will be able to identify and solve problems, reason, reflect, make sound mathematical decisions, and demonstrate flexibility of thought.

Technology. The use of technology in the classroom increases student interest and engagement, demonstrates the relevance of technology to students' lives, and offers students the opportunity to investigate problems, conjecture, and practise higher-order thinking skills.

Literacy. In this course, students will be required to demonstrate their literacy skills by writing several non-fiction pieces. Teachers will provide appropriate topics such as explanations of current and emerging technologies; social, economic, and environmental effects of technology; and current and emerging Information and Communications Technology careers.

Evaluation policy. Please refer to the Student Agenda and the class website. Note, in particular, that late assignments are subject to a penalty of 5% per school day.

Extra help by appointment and during announced scheduled times.

Communication

Mr. Arkin (curriculum leader):
classroom: Lab C15
office: Computing Clubhouse, room C14
telephone: (416) 395-3310 extension 20091 (best time to call is before 08h30)

Ms. Xie:
classroom: Lab C3
office: Mathematics Office, room 225
telephone: (416) 395-3310, extension 20080 (best time to call is before 08h30)

Absences & Evaluations

1. If you know prior to the evaluation that you will be absent, make other arrangements with your teacher regarding that particular assessment.
2. If for some reason you are absent on the day of an evaluation:
   (a) *Mr. Arkin:* before 08h30, leave him a Wikispaces e-mail message. *Ms. Xie:* before 08h30, telephone and talk to her or leave her a message.
   (b) On the first day back, a note from your parent/guardian is required.

Teaching, Assessment & Evaluation Strategies

A variety of instructional strategies will be used to address student needs, and a variety of assessment and evaluation techniques will be used. Assessment for learning (formative assessment) will be administered before assessment of learning (summative evaluation).

Student success is greatly enhanced by good attendance, good behaviour, and class participation. Completion of **daily** homework exercises and writing of all evaluations will provide feedback on student learning. For courses with multiple sections, summative evaluations will assess common expectations.

Quizzes and assignments will be scheduled throughout the course. A summative test will conclude a unit or a group of related units. Below is a list of anticipated evaluations. This list may be modified to accommodate circumstances that arise throughout the semester.

Units	*Achievement Categories*
1: Programming concepts and skills	
assignments	all
projects	all
test	all
2: Software development	
assignments	all
quizzes	all
tests	all
3: Designing modular programs	
assignments	all
projects	all
tests	all
4: Topics in computer science	
assignments	all
projects	all
tests	all

Term mark *(70% of final grade)*
knowledge: 25%
application: 30%
communication: 20%
thinking: 25%

Summative mark (30% of final grade)
final exam: 30%

IB SL assessment
examination paper 1: 45%
examination paper 2: 25%
internal assessment: 30%

IB HL assessment
examination paper 1: 40%
examination paper 2: 20%
examination paper 3: 20%
internal assessment: 30%

Learning skills. Categories evaluated as *Needs Improvement, Satisfactory, Good,* or *Excellent:*
- responsibility
- independent work
- initiative
- organization
- collaboration
- self-regulation

Accommodations. In accordance with Ontario Regulation 181/98, for each unit of this course, instructional and assessment activities will take into account the strengths, needs, learning expectations, and accommodations identified in Individual Education Plans whether or not students are formally identified.