

# Catholic District School Board of Eastern Ontario

## Notre Dame Catholic High School

<b>COURSE TITLE:</b>	Computer Science, Grade 12, University
<b>COURSE CODE:</b>	ICS 4U
<b>CREDIT VALUE:</b>	1
<b>LEVEL OF DIFFICULTY:</b>	University
<b>AREA OF STUDY:</b>	Computer Science
<b>SUGGESTED PREREQUISITE(S):</b>	ICS 4U
<b>NUMBER OF SCHEDULED HOURS:</b>	110
<b>FACILITATOR(S):</b>	Mr. Mark Melville
<b>WRITER(S):</b>	Mr. Mark Melville
<b>DATE OF PREPARATION:</b>	September, 2009
<b>MINISTRY GUIDELINES:</b>	The Ontario Curriculum, Computer Studies, Grades 11 and 12, 2009 <a href="http://www.edu.gov.on.ca/eng/curriculum/secondary/computer10to12_2008.pdf">http://www.edu.gov.on.ca/eng/curriculum/secondary/computer10to12_2008.pdf</a>

### **COURSE DESCRIPTION:**

This course helps students use programming and software engineering principles to design and develop algorithms and programs. Students will use software development and diagnostic tools, implement data structures and algorithms, and use file management techniques in project settings. They will also develop an understanding of the ethics of computer use and the impact of information technology on the community, and will explore post-secondary education and career paths in computer science.

*The Canadian software industry is one of the fastest growth sectors in our economy. From 1970 to 1994 its work force has exploded from 22,000 to 173,000. Software development has evolved into a diverse and dynamic industry which impacts all Canadians. The various software programs used in our modern world were devised, designed and coded by people. One of the biggest challenges facing the industry is that the need for qualified software workers far outstrips the supply. In 1997 almost 20,000 Canadian software positions went unfilled. Without some innovative solutions to this problem, this booming economic force will suffer, having an effect on Canadians all across the country.*

Software Human Resources Council  
<http://www.shrc.ca/>

### ***RATIONALE / REAL LIFE CONNECTORS:***

In today's world, the use of the computer technology has infiltrated every aspect of our lives. Students must be able to become fluent in the language of the "Technology Age" in which we find ourselves immersed. If the students are to become productive and successful members of the 21st century, they must become comfortable with the use of and more aware of the implications of the computer in our changing society. This advanced introductory course to computer studies serves as a starting position for the student to begin to explore the uses and issues of technology.

***UNITS OF STUDY:*** (not necessarily in order; timelines are estimates only)

1. Review of software design process and programming techniques *2 weeks*
2. Data Structures *4-5 weeks*
3. Introduction to Object Oriented Programming *6-8 weeks*
4. Ethics and the impact of computers on society *1 week*
5. Post-secondary Computer Education and Careers *1 week*
6. Cumulative Assessment Tasks *4-5 weeks*

### ***CATHOLIC GRADUATE EXPECTATIONS:***

- an effective communicator
- a reflective and creative thinker
- a self-directed, responsible, life long learner
- a collaborative contributor
- a caring family member
- a responsible citizen

### ***HOW THIS COURSE SUPPORTS THE ONTARIO CATHOLIC SCHOOL GRADUATE EXPECTATIONS***

The Computer and Information Science program in the Catholic faith community enables young adults to develop and utilize their gifts and resources in finding solutions that benefit others in ways that model Gospel values. The curriculum focus enables students to be critical thinkers and innovative problem solvers and analyse the use of resources while understanding the implications of technological innovations. Emphasis on process and results ensures students apply skills and knowledge when providing services and recognize our God-given responsibility to respect the dignity and value of the individual and the protection of the environment. Computer technology has an ever-increasing effect upon society (e.g., the digital divide: the division of groups in society based upon the access to information that further disadvantages the poor). It is important for young Catholics to reflect upon and examine the potential of technology to affect lives.

### ***LEARNING EXPECTATIONS:***

(quoted from the Ministry Guidelines:

[http://www.edu.gov.on.ca/eng/curriculum/secondary/computer10to12\\_2008.pdf](http://www.edu.gov.on.ca/eng/curriculum/secondary/computer10to12_2008.pdf))

- A1. demonstrate the ability to use different data types and expressions when creating computer programs;
- A2. describe and use modular programming concepts and principles in the creation of computer programs;
- A3. design and write algorithms and subprograms to solve a variety of problems;
- A4. use proper code maintenance techniques when creating computer programs.
- B1. demonstrate the ability to manage the software development process effectively, through all of its stages – planning, development, production, and closing;
- B2. apply standard project management techniques in the context of a student-managed team project.
- C1. demonstrate the ability to apply modular design concepts in computer programs;
- C2. analyse algorithms for their effectiveness in solving a problem.
- D1. assess strategies and initiatives that promote environmental stewardship with respect to the use of computers and related technologies;
- D2. analyse ethical issues and propose strategies to encourage ethical practices related to the use of computers;
- D3. analyse the impact of emerging computer technologies on society and the economy;
- D4. research and report on different areas of research in computer science, and careers related to computer science.

### ***COURSE ASSESSMENT***

Student achievement will be based on the achievement chart categories outlined below and individual demonstration of the specific expectations. Achievement chart categories will be posted in the classroom and distributed to students for greater awareness and understanding of assessment. All major assignments will be evaluated by levels. Grades will be determined using the students’ most consistent and most recent levels of achievements. For purposes of reporting, the percentage grade range will correspond to the following levels as defined by the board:

<b>Level</b>	<b>Mark/Code</b>	<b>Level</b>	<b>Mark/Code</b>	<b>Level</b>	<b>Mark/Code</b>	<b>Level</b>	<b>Mark/Code</b>
4++	98/100						
4+	94	3+	79	2+	69	1+	59
4	86/90	3	75	2	65	1	55
4-	82	3-	72	2-	62	1-	52

### **The Achievement Chart for Technology**

The achievement chart is the fundamental tool of evaluating the progress of students. The chart identifies four categories of knowledge and skills in Technology: Knowledge and Understanding, Thinking and Inquiry, Communication and Application. The achievement

chart provides a standard province-wide method for teachers to use in assessing and evaluating their students' achievement. Each achievement chart has descriptions of the levels of achievement for each of the four categories of knowledge and skills. Level 3 is the provincial standard; level 4 indicates a level of achievement beyond the standard; level 2 indicates the student is slightly below provincial standard; and level 1 indicates limited understanding of the material. The achievement chart helps determine, throughout the course, the student's most consistent level of achievement of the curriculum expectations as reflected in his or her course work.

### **Achievement Chart Category Descriptions**

*Knowledge and Understanding* – the degree to which the student demonstrates understanding of the facts, concepts, and relationships between concepts.

*Thinking and Inquiry* – the student utilises proper problem solving techniques, strategies, resources, technology and tools.

*Communication* – the student demonstrates he/she can communicate with clarity, accuracy, effectiveness, and confidence in various forms. Effective communication implies timeliness, presentation and completeness.

*Application* – the student demonstrates he/she can apply ideas and skills in familiar and unfamiliar settings, use proper technological techniques, and make connections between the curriculum and the world.

### ***COURSE EVALUATION***

#### *Formative Evaluation*

Formative Evaluation is used to measure students' learning skills and as a means of diagnostic assessment to improve learning.

*Summative Evaluation: 70%*

*Final Assessment: 30%*

Cumulative Assessment Project(s) 30%

*\*\*Students must submit the culminating activity to pass the course*

### ***COURSE EXPECTATIONS:***

Each student in this course is expected to:

1. Treat everyone in the room with respect.
2. Treat the equipment in the room with respect.
3. Come to class with a notebook, paper, and a pen.
4. Be on time for class. Being late for class may merit a detention. Chronic lateness will be dealt with by Administration.
5. Come to class wearing a complete uniform, as outlined under the school uniform guidelines. Uniform issues will be dealt with by administration. Your return to class will be considered a late for attendance purposes.
6. Keep the room in order; ie., no writing on desks, no eating in the classroom, etc.
7. Catch up on all work missed due to absence. This is YOUR responsibility.
8. **Summative Assignments that are not submitted on the given due date are subject to**

**the Notre Dame Late Policy**

9. Students may, for legitimate reasons, negotiate an extension or due date change with the teacher prior to the original due date. Approval for such a change will be at the discretion of the teacher. Computer printing problems will not be accepted as legitimate reasons for late assignments. If such a situation should occur the student must either present a hand written assignment or a computer disc that the teacher can read on a computer compatible with the Notre Dame computer system. This must be done on the day the assignment is due.
11. Read and abide by the Notre Dame Acceptable Use Policy

\*\*\* The above expectations will be continually monitored throughout the course.