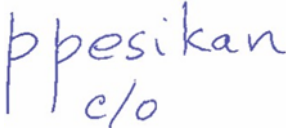# Course Outline

CENTENNIAL COLLEGE

School:	Eng. Tech. & Applied Science
Department:	Information and Communication Engineering Technology (ICET)
Course Title:	Programming 2
Course Code:	COMP 123
Course Hours/Credits:	56
Prerequisites:	COMP 100
Co-requisites:	COMP 100
Eligible for Prior Learning, Assessment and Recognition:	Yes
Originated by:	Programming Languages Group
Revised by:	Narendra Pershad
Revision Date:	Summer 2014
Current Semester:	Fall 2016
Approved by:	ppesikan c/o

Chairperson/Dean

Students are expected to review and understand all areas of the course outline.

Retain this course outline for future transfer credit applications. A fee may be charged for additional copies.

This course outline is available in alternative formats upon request.

Course Description

In Programming II, students will learn the fundamentals of object-oriented programming (OOP) concepts including data abstraction, inheritance and polymorphism. Students will learn to design, code and document object-oriented programs. The concepts in COMP123 will be presented using both Console and Windows-based applications

Program Outcomes

Successful completion of this and other courses in the program culminates in the achievement of the Vocational Learning Outcomes (program outcomes) set by the Ministry of Training, Colleges and Universities in the Program Standard. The VLOs express the learning a student must reliably demonstrate before graduation. To ensure a meaningful learning experience and to better understand how this course and program prepare graduates for success, students are encouraged to review the Program Standard by visiting http://www.tcu.gov.on.ca/pepg/audiences/colleges/progstan/. For apprenticeship-based programs, visit http://www.collegeoftrades.ca/training-standards.

Course Learning Outcomes

The student will reliably demonstrate the ability to:

1. Design, code and test a program that implements methods with parameter list. The program must pass and be supported by the chosen programming language
2. Design, code and test a program that stores the data in a dynamically allocated array of appropriate types.
3. Design, code and test a program that defines and uses classes, and controls the accessibility of class members.
4. Design, code and test a program that uses inheritance and composition.
5. Design, code and test a program that uses abstract base classes and interfaces.
6. Design, code and test a program that implements polymorphism.
7. Design, code and test a program that stores the data in sequential text files.
8. Design, code and test a program that uses exception handling.
9. Design, code and test a programs that uses a Graphical User Interface (GUI) to interact with users.
10. Design and test programs that use LINQ to query and retrieve data from a data source.
11. Design and test programs that use EDM Framework to access databases.

Essential Employability Skills (EES)

The student will reliably demonstrate the ability to*:

1. Communicate clearly, concisely and correctly in the written, spoken, and visual form that fulfills the purpose and meets the needs of the audience.
2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
3. Execute mathematical operations accurately.
4. Apply a systematic approach to solve problems.
5. Use a variety of thinking skills to anticipate and solve problems.
9. Interact with others in groups or teams in ways that contribute to effective working relationships and the achievement of goals.
10. Manage the use of time and other resources to complete projects.
11. Take responsibility for one's own actions, decisions, and consequences.

There are 11 Essential Employability Skills outcomes as per the Ministry Program Standard. Of these 11 outcomes, the following will be assessed in this course.

Global Citizenship and Equity (GC&E) Outcomes

N/A

Methods of Instruction

Professor led discussion, directed reading and hands on labs

Text and other Instructional/Learning Materials

Text Book(s):

Farrell, Joyce. 2013. Microsoft® Visual C#® 2012: An Introduction to Object Oriented Programming (5th Edition.): Course Technology, Cengage Learning.

ISBN 10: 1285096339

ISBN 13: 978-1285096339

Classroom and Equipment Requirements

Computers and access to required software

Evaluation Scheme

⇨ Test 1: TO be completed in week 5

⇨ Test 2: To be completed in week 8

⇨ Test 3: To be completed in week 14

⇨ Assignments: Eight assignments to be completed in weeks 1, 2, 3, 6, 7, 9, 10 and 11

⇨ Quizzes: Lab exercises and quizzes upon the completion of each major topics

Evaluation Name	CLO(s)	EES Outcome(s)	GCE Outcome(s)	Weight/100
Test 1	1, 2, 3	1		25
Test 2	4, 5, 6	3		25
Test 3	9, 10, 11			20
Assignments	1, 3, 4, 5, 6, 7, 8, 10	5, 9, 10, 11		20
Quizzes	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11	1, 2, 4		10
Total				100%

If students are unable to write a test they should immediately contact their professor or program Chair for advice. In exceptional and well documented circumstances (e.g. unforeseen family problems, serious illness, or death of a close family member), students may be able to write a make-up test.

All submitted work may be reviewed for authenticity and originality utilizing Turnitin®. Students who do not wish to have their work submitted to Turnitin® must, by the end of the second week of class, communicate this in writing to the instructor and make mutually agreeable alternate arrangements.

When writing tests, students must be able to produce official College photo identification or they may be

refused the right to take the test or test results will be void.

Student Accommodation

It is College Policy to provide accommodation based on grounds defined in the Ontario Human Rights Code. Accommodation may include modifications to standard practices. Students with disabilities who require academic accommodations must register with the Centre for Students with Disabilities. Students requiring accommodation based on other human rights grounds should talk with their professors as early as possible. Please see the Student Accommodation Policy.

Use of Dictionaries

- Only English Language Learner dictionaries are permitted in class work (English words, idioms, and pronunciations are explained).

Program or School Policies

N/A

Course Policies

N/A

College Policies

Students should familiarize themselves with all College Policies that cover academic matters and student conduct.

All students and employees have the right to study and work in an environment that is free from discrimination and harassment and promotes respect and equity. Centennial policies ensure all incidents of harassment, discrimination, bullying and violence will be addressed and responded to accordingly.

Academic honesty is integral to the learning process and a necessary ingredient of academic integrity. Academic dishonesty includes cheating, plagiarism, and impersonation. All of these occur when the work of others is presented by a student as their own and/or without citing sources of information. Breaches of academic honesty may result in a failing grade on the assignment/course, suspension or expulsion from the college.

For more information on these and other policies, please visit www.centennialcollege.ca/about-centennial/college-overview/college-policies.

Students enrolled in a joint or collaborative program are subject to the partner institution's academic policies.

PLAR Process

This course is eligible for Prior Learning Assessment and Recognition (PLAR). PLAR is a process by which course credit may be granted for past learning acquired through work or other life experiences. The

PLAR process involves completing an assessment (portfolio, test, assignment, etc.) that reliably demonstrates achievement of the course learning outcomes. Contact the academic school to obtain information on the PLAR process and the required assessment.

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Topical Outline (subject to change):

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
1	Course Overview, Reviewing basic elements of a C# program, control structures, etc.	Chapter 1, 2 & 4	Upon the completion of this work The learner will have a good understanding of programming languages including the evolution of C# and .NET. The basic elements of a C# program are reviewed. The student should be able to compile, run and build a C# application using Visual Studio .NET 2012 IDE.	Lecture Demonstration Lab Session	Assignment 1	
2	Advanced Method Concepts	Chapter 8	Upon the completion of this work the learner will have a good understanding of methods in C#. The student will be able to use overloaded methods	Lecture Demonstration Lab Session	Assignment 2	
3-5	Using classes and Objects	Chapter 9	Upon the completion of this work the learner will have a good understanding of the fundamental features of Object-Oriented Programming, classes and objects. The student will be able to list all the data and function members of a C# class. The student should know the difference between static and non-static members and be able to use access modifiers and auto-implemented properties. Anatomy of a C# class will be fully examined.	Lecture Demonstration Lab Session	Assignment 3 Test 1	Test 1 in the last class of Week 5
6	Object-Oriented Programming - Inheritance	Chapter 10 Lecture Handouts	Upon the completion of this work the learner shall be capable of designing classes that inherit from other classes. The student will study the relationship between base classes and derived classes and will be introduced to protected and internal members. The student will understand the use of the base, this, virtual, override, abstract and sealed keywords	Lecture Demonstration Lab Session	Assignment 4	
7	Object-Oriented Programming – Polymorphism, Interfaces	Chapter 10 Lecture Handouts	Upon the completion of this work the learner will have a good understanding of polymorphism and implementing it in C#. Abstract classes and Interfaces will be used here to illustrate various implementations of polymorphism in C#.	Lecture Demonstration Lab Session	Assignment 5	

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
			polymorphism in C#.			
8	Exception Handling and File I/O	Chapter 11 & 14	Upon the completion of this work the learner shall be capable of writing code that handles the exceptions. The C# exception-handling model will be explored and the student will be introduced to .NET Exception hierarchy. The student will be able to store data using file stream classes, read and write text files.	Lecture Demonstration Lab Session	Test 2	Test 2 in last class of Week 8
9-10	Using Controls and Event Handling	Chapter 12 & 13	Upon the completion of this work the learner will have a good understanding of GUI programming concepts, such as windows, forms and events. The student shall be capable of implementing basic event handling for various Windows controls. The student will be able to use TextBox, Label, Button, ComboBox, CheckBox, RadioButton, GroupBox, NumericUpDown, Timer and DataGridView controls to build Gui applications	Lecture Demonstration Lab Session	Assignment 6 & 7	
11-12	Chapter 14	Data Access with LINQ	Upon the completion of this work the learner will have a good understanding of implicitly typed variables and LINQ. The student will be able to use the following Linq Operators: Restriction, Projection, Filter, Order, Grouping, Aggregation and Conversion. Anonymous functions or lambda expression will be used to simplify linq statements	Lecture Demonstration Lab Session	Assignment 8	
13-14	Introduction to Entity Data Model Framework	Lecture Handouts	Upon the completion of this work the learner will have a good understanding of the EDM Framework The student will be able to write Windows applications that connect to MS-SQL Server 2012 databases and MS Access files.	Lecture Demonstration Lab Session	Test 3	Test 3 in the last class of week 14