Course Outline

School:	Eng. Tech. & Applied Science
Department:	Information and Communication Engineering Technology (ICET)
Course Title:	Programming 3
Course Code:	COMP 212
Course Hours/Credits:	56
Prerequisites:	COMP 123
Co-requisites:	N/A
Eligible for Prior Learning, Assessment and Recognition:	Yes
Originated by:	Programming Languages Group
Creation Date:	Fall 2003
Revised by:	Narendra Pershad, Ilia Nika
Revision Date:	Winter 2017
Current Semester:	Fall 2018
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.

Acknowledgement of Traditional Lands

Centennial is proud to be a part of a rich history of education in this province and in this city. We acknowledge that we are on the treaty lands and territory of the Mississaugas of the Credit First Nation and pay tribute to their legacy and the legacy of all First Peoples of Canada, as we strengthen ties with the communities we serve and build the future through learning and through our graduates. Today the traditional meeting place of Toronto is still home to many Indigenous People from across Turtle Island and we are grateful to have the opportunity to work in the communities that have grown in the treaty lands of the Mississaugas. We acknowledge that we are all treaty people and accept our responsibility to honor all our relations.

Course Description

The goal of this course is to enable students, already proficient in OOP, to build robust and more complex, data-driven Windows applications using the .NET languages. Coursework emphasizes some advanced topics, such as Delegate, advanced GUI programming, Entity Framework, functional programming, asynchronous programming, and parallel programming, etc.. The language of instruction is C#.

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 Advanced Education and Skills Development 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 the front end of a .NET application that uses advanced GUI components.
2. Develop database applications using entity framework.
3. Design, code and test applications by using Xamarin
4. Design, code and test a C# application that uses generics and generic collections in .NET.
5. Design, code and test a C# application that uses asynchronous programming.
6. Design, code and test a UWP application.
7. Explain Functional Programming and use LINQ to demonstrate functional programming techniques.
8. Design, code and test a C# application that uses custom controls.

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.
3. Execute mathematical operations accurately.
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

Interactive Lecture, demonstrations, hands-on lab sessions

Text and other Instructional/Learning Materials

Text Book(s):

Christian Nagel, Professional C# 7 and .NET Core 2.0, 7th Edition, Published by Wrox, ISBN-10:1119449278, ISBN-13:978-1119449270, April 2018. Available online.

Classroom and Equipment Requirements

Computers with access to the Internet and college storage. Software image in Software engineering labs includes all tools used in this course.

Evaluation Scheme

- Assignment 1: Practice Delegate
- Assignment 2: Implement UWP app
- Assignment 3: Implement UWP app to manipulate data within Database
- Assignment 4: Implement C# App using functional programming
- Assignment 5: Implement C# App using Asynchronous workflow
- Test 1 Hands-on: Test 1 will take place in week 7 and will cover material taught in weeks 1-6.
- Test 2 Hands-On: Test 2 will take place in week 14 and will cover material taught in weeks 7-13.

Evaluation Name	CLO(s)	EES Outcome(s)	GCE Outcome(s)	Weight/100
Assignment 1	1	3, 9, 11		10
Assignment 2	1, 2, 8	1, 3, 10		10
Assignment 3	1, 2, 4, 6	1, 3, 10, 11		10
Assignment 4	1, 4, 5, 6, 7	3, 10, 11		10
Assignment 5	1, 2, 3, 5, 6	3, 10, 11		10
Test 1 Hands-on	1, 2, 4, 6	3, 10, 11		25
Test 2 Hands-On	1, 5, 6	10, 11		25
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

Students with permanent or temporary accommodations who require academic accommodations are encouraged to register with the Centre for Students with Disabilities (CSD) located at Ashtonbee (L1-04), Progress (C1-03), Morningside (Rm 190), and Story Arts Campus (Rm 284). Documentation outlining the functional limitations of a disability is required; however, interim accommodations pending receipt of documentation may be possible. This service is free and confidential. For more information, please email csd@centennialcollege.ca.

Use of Dictionaries

- Any dictionary (hard copy or electronic) may be used in regular class work.

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.

Topical Outline (subject to change):

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
1-2	Course Overview Advanced GUI Programming Delegates and event handling in C#	Chapter 8	.Understand what a delegate is and how to use. .Use delegates to implement an observer design pattern .Understand how to raise event and handle event	Interactive Lecture Demonstration Lab Session	Assignment 1	Week 2
3-4	Advanced GUI Controls	Chapter 33-36	.Develop UWP app .Understand the data binding .Be able to define customized style	Interactive Lecture Demonstration Lab Session	Assignment 2	
5	Dependency system and User-Defined Controls	Lecture handout	. Design and implement a user-defined control with dependency propertoes.	Interactive Lecture Demonstration Lab Session		Week 4
6	Introduction to LINQ	Chapter 12	. Understand LINQ . Be able to write LINQ statement to manipulate data with IEnumerable collection by using Query syntax as well as Method syntax	Interactive Lecture Demonstration Lab Session		
7 - 8	Entity Framework	. Chapter 25 & 26 . lecture handout	. Understand ADO.NET . Understand Object-Relational Mapper . Be able to create ADO.NET entity data model from existing database .Be able to use DbContext object to write LINQ statement to manipulate data within database . Be able to develop UWP app to display data within database .Understand the difference between entity framework and entity framework core	Interactive Lecture Demonstration Lab Session	Assignment 3 Test 1	Week 8
9	Generic class & Generic Methods & Extension Methods	Chapter 5	. Be able to develop Generic classes . Be able to develop Generic methods . Be able to develop extension methods . Consume defined generic classes, generic methods and extension methods in C# app	Interactive Lecture Demonstration		
10	Functional Programming with LINQ	Chapter 13	.Use lambda expressions to create anonymous methods and refer to those methods via delegate variables. .Use LINQ method-call syntax and lambdas to demonstrate functional programming	Interactive Lecture Demonstration Lab Session	Assignment 4	Week 10

Week	Topics	Readings/Materials	Weekly Learning Outcome(s)	Instructional Strategies	Evaluation Name	Evaluation Date
			techniques.			
11	Asynchronous Programming in C#	Chapter 15	. Use async and await keywords to implement asynchronous calls. . Use Task-based Asynchronous Pattern to take advantage of multi-core processors. . Call a web service asynchronously.	Interactive Lecture Demonstration Lab Session	Assignment 5	Week 13
12	Task and Parallel programming	Chapter 21	Implement multi-threading app	Interactive Lecture Demonstration Lab Session		
13 - 14	Xamarin Forms	Chapter 37	Implement	Interactive Lecture Demonstration Lab Session	Test 2	Week 14