Module: Programming 251

Module name:	Programming 251
Code:	PRG251
NQF level:	6
Type:	Fundamental – Diploma in Information Technology (Software Development stream)
Contact time:	52 hours
Structured time:	8 hours
Self-directed time:	60 hours
Notional hours:	120 hours
Credits:	12
Prerequisites:	PRG152

Purpose

The aim of this course is to introduce the student to the diverse possibilities of professional User Interface Development for desktop applications. The course will focus on Windows Forms and students will learn how to create professional aesthetics and interactivity. Students will learn how to work with a large number of controls and containers, how to customize them and the powerful event handling exposed by Windows Forms. Students will have a sound understanding of programming paradigms with an emphasis on Object Oriented Programming. This course brings together all the concepts learnt in the various pre-requisite programming offerings and adds a few more advanced topics such as event driven programming.

Outcomes

Upon successful completion of this module, the student will be able to demonstrate:

- Detailed knowledge of Object Oriented Programming, concurrency and graphical user interfaces, including an understanding of and the ability to apply key concepts such as exception handling facilities in an Object Oriented Programming paradigm.

- The ability to evaluate, select and apply appropriate methods, procedures or techniques relevant to Object Oriented Programming.

- The ability to identify, analyse and solve problems in real world contexts, gathering evidence and applying object orientated solutions based on evidence and procedures appropriate to object-orientated design.

Assessment

Assessment is performed using a variety of instruments:

- Continuous evaluation of work through 2 assignments.
- Continuous evaluation of work through formative tests and a summative test which assess theoretical knowledge.
- Continuous evaluation of one project whereby the student must evaluate and present results on given problems.

- Final assessment through a written examination.

Teaching and Learning

Learning materials
Lecturer hand-outs and samples
Online prescribed sources

Prescribed Book
- Programming: OOP – IT without frontiers.

Additional Reference material:
📖 Sharp, J. (2015). *Microsoft Visual C# Step by Step*. Microsoft Press. [ISBN: 978-1509301041]

Learning activities
The teaching and learning activities consist of a combination of formal lectures on theoretical and practical concepts as well as exercises and discussions. Two mandatory assignments and one project must be completed during the course. The experiences and progress made on these practical components form the content of class discussions.

Notional learning hours

Activity	Units	Contact Time	Structured Time	Self-Directed Time
Lecture		40.0		24.0
Formative feedback		8.5		
Project	1	3.5		6.0
Assignment	2			6.0
Test	3		6.0	11.0
Exam	1		2.0	13.0
		52	**8.0**	**60.0**

Syllabus
- Introduction to OOP
- Object-Oriented Programming
    - Classes and objects
    - Methods and messages
    - Classification, generalization and specialization
    - Inheritance
    - Interfaces and inner classes
    - Polymorphism
    - Abstraction
- Events and delegates
- Concurrency
    - Threads
    - Background worker
    - Thread pool
- Architecture of Windows Forms
- Windows Forms basics
    - Controls and containers

- Exception Handling