5 Years of Integrated M.C.A.

CC10 GUI Programming
(060060406)

4th Semester

EFFECTIVE FROM JANUARY - 2017
UKA TARSADIA UNIVERSITY

Course Code: 060060406
Course Title: CC10 GUI Programming
Course Credits: 04
[Lectures: 04, Tutorial: 00, Practical: 05]

Prerequisites:
Knowledge of programming and Object Oriented Programming concepts
To provide fundamentals of .NET framework, C# language and to introduce
development of rich windows form applications with event driven programming model.

Objectives:

1. Introduction to .NET Framework and C# Fundamentals [15 %]
   1.1. .NET framework: Evolution and Benefits
   1.2. The .NET Architecture: Building Block of .NET Platform
   1.3. .NET Framework Class Library & CLR, CLS and CTS
   1.4. The .NET Assemblies: Single File and Multi-File Assemblies, Role of CIL, .NET Type Metadata and Assembly Manifest
   1.5. Introduction to Visual Studio & Creating Console and Windows applications
   1.6. Introduction to C#, creating applications in C#, similarities & difference with other languages

2. C# Language Basics [15 %]
   2.1. Variables, Data types, Operators (Arithmetic, Relational, Bitwise) and its precedence, boxing and un-boxing
   2.2. Flow control: Selection statement, Iteration statement, Jump statement
   2.3. Procedures: Subroutines and Functions, Argument passing mechanism, Returning value, Built in functions, Overloading functions
   2.4. Array: Declaring, Initializing, Multi-dimensional and Dynamic
   2.5. Exception handling: Structured and Unstructured error handling

3. OOP in C# [20 %]
   3.1. Concept of Class, Object, Encapsulation, Inheritance, Polymorphism in C#
   3.2. Static and Non-Static Members
   3.3. Constructors, Destructor
   3.4. Inheritance, Interface and Polymorphism: deriving classes, calling base class constructor, overriding Methods, non-inheritable classes, abstract class, interface inheritance

4. GUI Design and Event Driven Programming [15 %]
   4.1. Basic windows controls
   4.2. Concept of adding various Windows Controls
       Button, Label, TextBox, RadioButton, CheckBox, ComboBox, ListBox, PictureBox, ScrollBar, Toolstrip, Timer, Panel and GroupBox
   4.3. Windows form: appearance of form-properties of form, placing controls on forms, setting tab order, anchoring and docking, splitting forms into multiple forms, MDI (Multiple Document Interface)
   4.4. Working with the Events: handling Form events, Mouse events, Keyboard events

5. Advanced GUI controls [15 %]
   5.1. RichTextBox: text manipulation and formatting
   5.2. Dialog Boxes (ColorDialog, FontDialog, SaveFileDialog and OpenFileDialog)
   5.3. TreeView control: adding nodes at design time and runtime, scanning tree view control, Menu, (MenuStrip, ContextMenuStrip)
   5.4. ListView control: the column collection, ListView Items and subitems, Items collection, Subitems collection, sorting in ListView, processing selected Items.

6. Managing data with ADO.NET [20 %]
6.1. Introduction to ADO.NET
6.2. Concept of Connected and Disconnected Architecture
6.3. Data Providers in ADO.NET and connection Object
6.4. Working with the DataSet: creating, filling and modifying DataSet, DataGridView control and Data Binding
6.5. Accessing data: Executing query using Command object, Reading data

Course Outcomes: Upon completion of the course, students shall be able to

CO1: Comprehend key features of .NET framework and its class library.
CO2: Illustrate basic constructs of C# language.
CO3: Create windows form, react to its events and manipulate its content in code.
CO4: Design rich integrated and GUI windows applications.
CO5: Demonstrate data access, data manipulation and data binding techniques using ADO.NET.

Course Objectives and Course Outcomes Mapping:

To provide fundamentals of .NET framework: CO1.
To provide fundamentals of C# language: CO2.
Introduce development of rich windows form applications with event driven programming model: CO3, CO4 and CO5.

Course Units and Course Outcomes Mapping:

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>Unit</th>
<th>Course Outcome</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CO1</td>
</tr>
<tr>
<td>1</td>
<td>Introduction to .NET Framework and C# Fundamentals</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>C# Language Basics</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>OOP in C#</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>GUI Design and Event Driven Programming</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>Advanced GUI controls</td>
<td>✓</td>
</tr>
<tr>
<td>6</td>
<td>Managing data with ADO.NET</td>
<td></td>
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</tbody>
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Laboratory:

- A course teacher shall prepare a fresh practical list for each academic year with no repeated problems from previous two consecutive years.
- The practical problem list shall consists of "Required number of problems" for journal certification as well as "Practice problems" of varying nature from each unit as per its weightage and criticality.
- Journal shall be verified by the laboratory teacher as well as by the course teacher at least thrice in a semester at an interval of 10 laboratory sessions or an appropriate interval upon the discretion of the course teacher. Viva shall be conducted when the practical problem solution are checked in the journal by laboratory supervisor and/or course teacher.
- Laboratory supervisor or course teacher shall sign in the journal only if he/ she is satisfied by the work of student.
- Journal must not be certified if required number of problems are not included and not written clearly or copied.
- After approved by Programme Co-ordinator, the list of problem definitions shall be
kept by concern teacher on web site before the commencement of the semester.

**Computing Environment:**

A student must have the following computing environment in laboratory and/or on his/her laptop and.
- IDE like Microsoft Visual Studio 2010 or higher
- RDBMS like SQLExpress, MySql

**Modes of Transaction (Delivery):**

- Lecture method along with it, as and when required, discussion method shall be used. It shall be also supplemented with appropriate audio-visual aids.
- Demonstration shall be given for all topics of syllabus.
- Hands on practice shall be given for the topics which are difficult to understand during class room teaching.

**Activities/Practicum:**

The following activities shall be carried out by the students.
- Installation of IDE and RDBMS.
- Demonstrate Windows application as a group project.
- Demonstration of Report.

The following activities shall be carried out by the teacher.
- Comparative study of different versions of .NET family
- Discuss and Demonstrate windows services.
- Demonstrate Set Up project for windows applications.

**Text Books:**

2. Rebecca M. Riordan - Microsoft Press “Microsoft ADO. Net” – PHI

**References:**

1. Shibi Panilkkar, Kumar Sanjeev - “Magic of C# with .Net FrameWork” - Firewall media
2. Paul J. Deitel and Harvey M. Deitel - “C# 2008 for Programmers – Pearson
5. Bharat & Co - "Programming with C#"

**Concept Map:**

It is a hierarchical / tree based representation of all topics covered under the course. This gives direct / indirect relationship /association among topics as well as subtopics.
Unit-1:

Introduction to .NET Framework and C# fundamentals

- Technology before .NET, .NET Solution
- CLR, CTS and CLS

C#, Application, Other Languages

- .NET Assembly
  - Role of CIL
  - Assembly Manifest

- Single-File and Multiple-File
- .NET Type Metadata

Create console and window application

The .NET Architecture: Building Block of .NET Platform
Unit-2:

C# Language Basics

- Variables
- Datatypes
- Operators
- Arithmetic
- Relational
- Bitwise
- Boxing and Unboxing
- Flow Control
  - Selection statement
  - Iteration statement
  - Jump statement
- Exception Handling
- Array
  - Declaring
  - Multi-dimensional
- Dynamic
- Procedure
Unit-3:

- OOP in C#
  - Class and Object
  - Constructor and Destructor
  - Inheritance, Interface and Polymorphism
    - Including deriving classes
    - Calling base class constructor
    - Overriding Method
  - Interface inheritance
  - Abstract class
  - Non-inheritable classes
  - Static and Non-Static members
Unit-4:

GUI Design and Event Driven Programming

- Windows Controls
  - Button
  - Label
  - TextBox
  - RadioButton
  - CheckBox
  - ComboBox
  - ListBox
  - Panel
  - GroupBox
  - Timer
  - Toolstrip
  - ScrollBar
  - PictureBox

- Windows Form
  - Form Properties
  - Placing control on form
  - Setting tab order

- Events
  - Form Event
  - Mouse Event
  - Keyboard Event
  - MDI
    - Anchoring and docking
    - Setting tab order

Unit-5:

Advanced GUI controls

- RichTextBox
  - Text manipulation
    - formatting
- Dialog Boxes
  - OpenFileDialog
  - SaveFileDialog
  - ColorDialog
  - FontDialog

- ListView control
- Menu
  - MenuItem
  - ContextMenuStrip
Unit-6:

Assessment:
- The weightage of Continuous Internal Evaluation (CIE) and University examination shall be as per the University regulations.
- At the institute level, the structure of CIE for a course shall comprise of assessment parameters like Quizzes, Unit Tests, Assignments, Mini Project, and Self-Creation Parameter applicable to both theory and practical courses.
- The frequency and weightage of each of the above assessment parameters may vary from time to time to satisfy course objectives and outcomes so as to achieve programme educational objectives and its outcomes.
- The courses teacher is free to decide the number of assessment parameters and their frequency for a course subject to prior approval of the programme co-ordinator/Director.
- The assessment policy document should be uploaded on the web before the commencement of the semester.
- Syllabus for each CIE parameter shall be covered by the date of the corresponding test.
- No make-up work shall be conducted unless approval from Programme Co-ordinator/Director.

Question Bank:
Question Bank must be prepared which consists of several types of questions namely Matching type questions, Rearrangement of source code, missing code, Multiple Choice Questions, Fill in the blanks, Short type questions, long type questions etc. Question bank must not be exactly same as of previous years.

Academic Honesty:
Journal work is assumed to be accomplished individually by a student.

UFM:
- If two or more submitted papers are similar for coincidence, a penalty shall be imposed
that shall usually be the same for all concern.

- Any ascertained fact of breaking institute policy shall be associated with one or all of the following: (i) zero marks for the work; (ii) report to the programme coordinator; (iii) report to the Director.

Attendance:

- Attendance means being present for the entire class session. Those arriving significant late or leaving significantly early without prior permission shall be counted as ABSENT for the entire class session.
- Concern teacher must clearly state his/her attendance policies at the first class meeting.