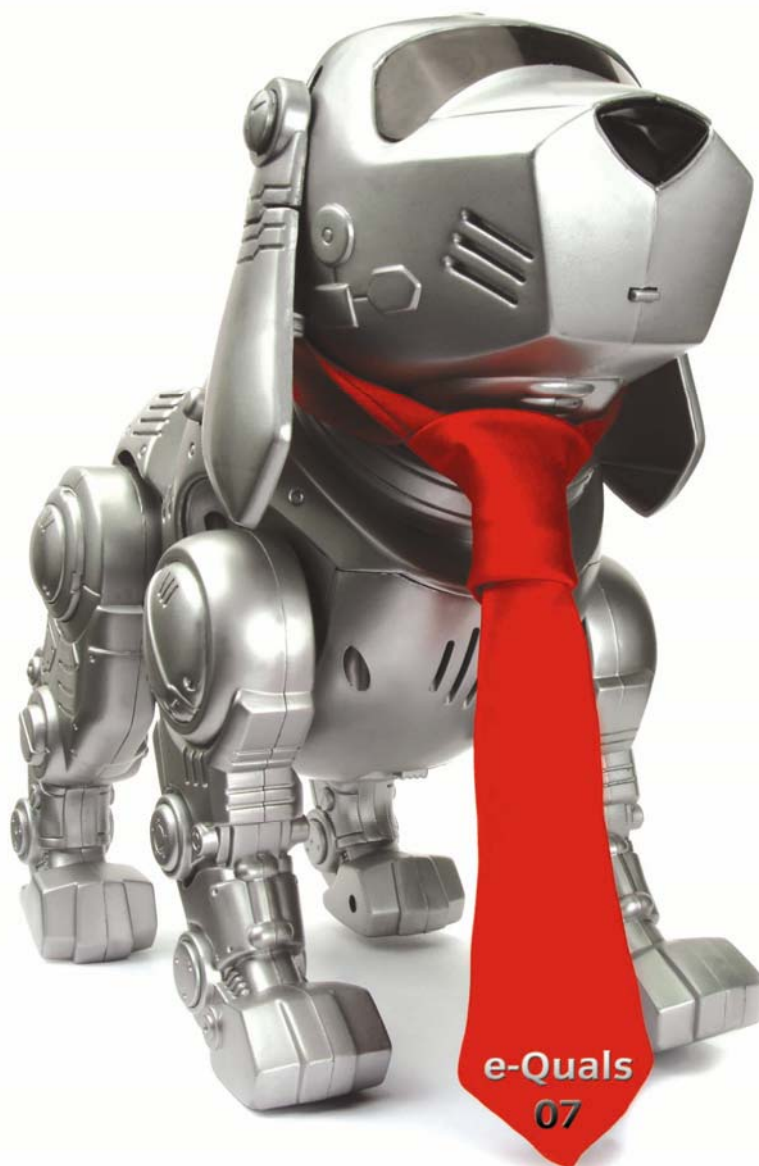


e-Quals Unit Syllabus

Level 2 Create software components using C#
7266/7267-206



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Rationale

The aim of this unit is to enable candidates to understand the principles required to create software using the C# programming language and an introduction to the .NET framework. Candidates will develop the skills required to create and test software components or small software systems to solve a given problem.

Learning outcomes

There are **five** outcomes to this unit. The candidate will be able to:

Manage the development environment

Use components to create a Graphical User Interface (GUI)

Create code for a specified software component

Use the debug facilities of the development environment

Test a software component and produce printed output

Guided learning hours

It is recommended that 60 hours should be allocated for this unit. This may be on a full time or part time basis.

Connections with other qualifications

This unit contributes towards the knowledge and understanding required for the following qualifications:

Outcome

This award contributes to the knowledge and understanding of the following Areas of Occupational Competence in the City & Guilds NVQ for IT Practitioners (4324)

1, 2, 3, 4, 5

211 Software development – component creation 2

Key Skills

This unit contributes towards the Key Skills in the following areas:

| | |
|------------------------|---------------------|
| Communication | C3.2 |
| Application of Number | N1.1 |
| Information technology | None |
| Working with others | None |
| Improving own learning | LP3.1, LP3.2, LP3.3 |
| Problem solving | PS3.1, PS3.2, PS3.3 |

Key Stage 4 links

| | |
|--------------|---------------------------|
| Outcome 1, 3 | Finding information |
| Outcome 2, 3 | Developing ideas |
| Outcome 2 | Communicating information |
| Outcome 4, 5 | Evaluating |

Assessment and grading

Assessment will be by means of a **set assignment** covering practical activities and a **multiple choice** test covering underpinning knowledge.

Unit 206

Outcome 1

Create software components using C#

Manage the development environment

Practical skills

The candidate will be able to:

- 1 use the development environment
 - a help facilities
 - b menus
 - c toolbar
 - d toolbox
 - e windows (code, debug, form, solution explorer, properties)
 - f dialog boxes
 - g Object Browser
- 2 create and save form and project files with meaningful names
- 3 use the .NET framework when executing applications.

Underpinning knowledge

The candidate will be able to:

- 1 describe the purpose and function of the following file types:
 - a **exe**
 - b **cs**
 - c **csproj**
 - d **sln**
- 2 identify that the language is case sensitive.

Unit 206

Outcome 2

Create software components using C#

Use components to create a Graphical User Interface (GUI)

Practical skills

The candidate will be able to:

- 1 create a form and controls
- 2 place a control on a form by drawing, selecting and dragging into position and resizing using control handles
- 3 change default properties of forms and controls at design time
- 4 give meaningful names to forms and controls using a consistent naming convention
- 5 change the settings of the text related properties of controls
- 6 change the settings of the colour properties of controls
- 7 change the settings of the functional properties of controls
- 8 change the settings of the display related properties of controls
- 9 use a GroupBox control to group and contain other controls
- 10 select multiple controls on a form to drag the controls as a group or to set a common property of the group
- 11 use copy and paste to duplicate a control on a form.

Underpinning knowledge

The candidate will be able to:

- 1 identify Form1 as the default project start-up form
- 2 describe in simple terms the functions of controls
- 3 state that each type of control possesses a subset of the total number of available properties
- 4 state that, depending on the property and the control, a property setting may be: changed at design time or run-time; changed only at design time; read at run-time; not available at run-time
- 5 describe the purpose of objects, methods and properties
- 6 state that copied controls copy the property values from the original control
- 7 explain the use of controls
 - a **Button**
 - b **CheckBox**
 - c **ColorDialog**
 - d **ComboBox**
 - e **FontDialog**
 - f **GroupBox**
 - g **HScrollBar**

- h **Label**
- i **ListBox**
- j **MenuStrip**
- k **OpenFileDialog**
- l **PictureBox**
- m **RadioButton**
- n **RichTextBox**
- o **SaveFileDialog**
- p **TextBox**
- q **Timer**
- r **VScrollBar**

8 state the purpose of the AcceptButton, CancelButton and StartPosition properties of a form

9 state the purpose of the text related properties of controls

- a **Font**
- b **Items**
- c **Lines**
- d **Multiline**
- e **Name**
- f **PasswordChar**
- g **SelectionAlignment**
- h **SelectionColor**
- i **SelectionFont**
- j **Text**
- k **TextAlign**
- l **WordWrap**

10 identify the settings of the functional properties of controls

- a **CheckAlign**
- b **Checked**
- c **CheckState**
- d **Enabled**
- e **Locked**
- f **Interval**
- g **LargeChange**
- h **Maximum**
- i **Minimum**
- j **SmallChange**
- k **Value**

11 describe the purpose of display related properties of controls

- a **AutoSize**

| | |
|---|---------------------|
| b | BackColor |
| c | BorderStyle |
| d | Cursor |
| e | DialogResult |
| f | Dock |
| g | ForeColor |
| h | Image |
| i | ScrollBars |
| j | SizeMode |
| k | TabIndex |
| l | TabStop |
| m | Visible |
| n | WindowState. |

Unit 206

Outcome 3

Create software components using C#

Create code for a specified software component

Practical skills

The candidate will be able to:

- 1 use comments to document code
- 2 declare and use variables of type int, bool, char, double, float, long, string and create new objects
- 3 declare and use a single dimension array
- 4 declare and use constants and built-in predefined constants as appropriate
- 5 use operators
 - a assignment operator: =
 - b relational operators: ==, <, >, !=, <=, >=
 - c arithmetic operators: +, -, *, /, %, ++, --
 - d logical operators: &&, ||
- 6 create program constructs for selection: **if, if...else, switch**
- 7 create program constructs for iteration: **for, do...while, while**
- 8 display a message to the user
- 9 use methods for controls
- 10 read and write control properties during execution
- 11 write event handling code for events for controls
- 12 obtain input from the user
- 13 convert data from one type to another
- 14 use try...catch... finally to catch exceptions
- 15 create menus using the **MenuStrip** control
- 16 use shortcut keys for menus and controls
- 17 use dialog controls
- 18 open and save a file in rtf format
- 19 use properties and methods to manipulate text in a RichTextBox.

Underpinning knowledge

The candidate will be able to:

- 1 describe the use of dialog controls
- 2 state the function of dialog controls' properties
 - a **DefaultExt**
 - b **FileName**
 - c **Filter**

d **FilterIndex**

e **FullOpen**

f **OverwritePrompt**

- 3 state the difference between Private and Public declarations
- 4 describe the functions of the syntax checker
- 5 explain the meaning of the type void
- 6 state the syntax for comments
- 7 describe the relational operators
- 8 describe the logical operators
- 9 describe the precedence rules for arithmetic and the effect of parenthesis
- 10 state the limitations on the use of reserved words
- 11 describe the operation of iteration program constructs: **for, do...while, while**
- 12 describe the operation of selection program constructs: **if, if...else, switch**
- 13 describe the structure of a sequential file and the use of the LoadFile and SaveFile methods for a RichTextBox.

Unit 206

Outcome 4

Create software components using C#

Use the debug facilities of the development environment

Practical skills

The candidate will be able to:

- 1 use debug facilities to locate logical errors
- 2 break software execution using Ctrl+Break
- 3 set and clear breakpoints in code
- 4 use single step mode to trace code execution
- 5 obtain variable values at breakpoints using available display windows.

Underpinning knowledge

The candidate will be able to:

- 1 describe the operation and purpose of breakpoints in code.

Unit 206

Outcome 5

Create software components using C#

Test a software component and produce printed output

Practical skills

The candidate will be able to:

- 1 use test data to determine the expected results from a software component
- 2 compare the expected to the actual results and correct any errors
- 3 resolve syntax, logical and run-time errors found during testing
- 4 provide evidence that the program complies with the specification
- 5 test the operation of an EXE file
- 6 print a form (screen print)
- 7 print a listing of code.

Underpinning knowledge

The candidate will be able to:

- 1 describe and state the difference between syntax errors and logical errors
- 2 identify the cause of a run-time error
- 3 state the reasons for testing a software component prior to implementation
- 4 identify that testing for expected output can assist in determining whether or not a program is working correctly and conforms to the specification.

Unit record sheet

Use this form to track your progress through this unit.

Tick the boxes when you have covered each outcome. When they are all ticked, you are ready to be assessed.

| Outcome | ✓ | Date |
|--|--------------------------|------|
| 1 Manage the development environment | <input type="checkbox"/> | |
| 2 Use components to create a Graphical User Interface (GUI) | <input type="checkbox"/> | |
| 3 Create code for a specified software component | <input type="checkbox"/> | |
| 4 Use the debug facilities of the development environment | <input type="checkbox"/> | |
| 5 Test a software component and produce printed output | <input type="checkbox"/> | |

Candidate Signature Date

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