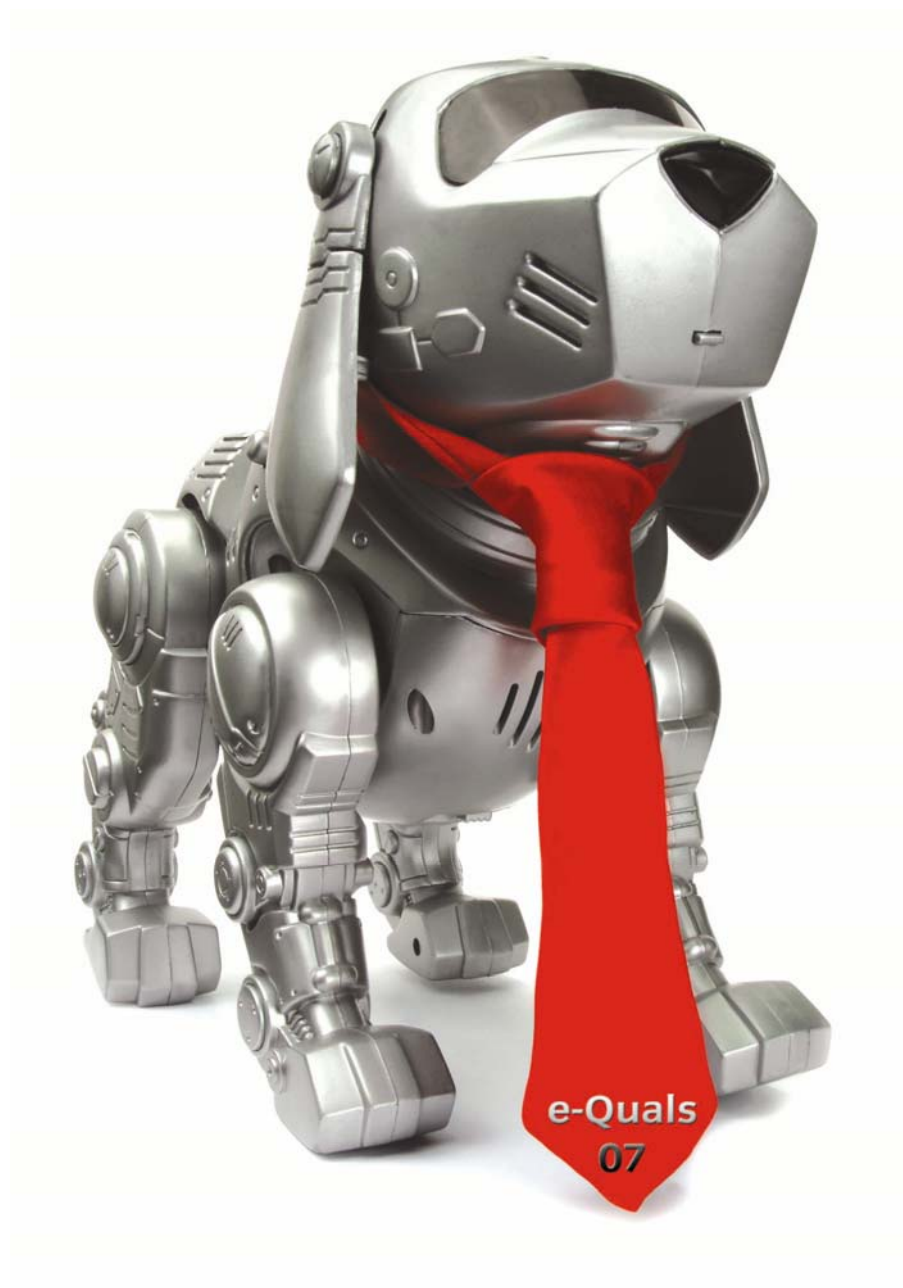


# e-Quals Unit Syllabus

**Level 2 Create software components using Java**  
7266/7267-205



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**Rationale**

The aim of this unit is to enable candidates to understand the principles required to create applets using the Java programming language. 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 **four** 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

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	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

**Assessment and grading**

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

## Unit 205

### Outcome 1

## Create software components using Java

### Manage the development environment

#### Practical skills

The candidate will be able to:

- 1 access the development environment
- 2 create a source code file (**Java**) for a Java applet
- 3 compile a source code file into a bytecode file (**class**)
- 4 resolve syntax errors flagged by the compiler
- 5 create an **HTML** file which contains a reference to a Java applet
- 6 run an applet using the appletviewer or a browser
- 7 exit the development environment.

#### Underpinning knowledge

The candidate will be able to:

- 1 describe the purpose and function of the following file types:
  - a **Java**
  - b **class**
  - c **html**
- 2 state the difference between a Java application and a Java applet
- 3 state the relationship between an applet, an HTML document and a browser.

## Unit 205

### Outcome 2

## Create software components using Java

Use components to create a Graphical User Interface (GUI)

### Practical skills

The candidate will be able to:

- 1 design the layout of components
- 2 create and use methods to manipulate components
- 3 create and use methods to manipulate a dialog
- 4 set the attribute values of component objects
- 5 load, display and scale images
- 6 draw lines and shapes and use different text fonts and font styles
- 7 handle events generated by components.

### Underpinning knowledge

The candidate will be able to:

- 1 describe components with which the user can interact via a mouse or keyboard:
  - a Text field
  - b Label
  - c Text area
  - d Check box
  - e Radio button
  - f Choice
  - g List
  - h Button
  - i Frame
  - j Menu
- 2 describe Frames and Menus
- 3 state that a **Panel** is a container used for organising components
- 4 state the difference between a modal and non-modal dialog.

## Unit 205

### Outcome 3

## Create software components using Java

Create code for a specified software component

### Practical skills

The candidate will be able to:

- 1 use comments to document code
- 2 use consistent indentation and presentation of code to improve readability
- 3 use the **import** statement to access predefined classes from packages
- 4 declare and use the data types:
  - a **int**
  - b **float**
  - c **char**
  - d **boolean**
- 5 declare and use constants and built-in predefined constants as appropriate
- 6 create and use a one-dimensional array
- 7 create new objects
- 8 use and manipulate String, Font and Color objects
- 9 create user-defined classes
- 10 use extends to create a user defined class
- 11 use operators:
  - a assignment operator =
  - b relational operators: ==, <, >, !=, <=, >=
  - c arithmetic operators: +, -, \*, /
  - d logical operators: && (AND), || (OR), ! (NOT)
- 12 use program constructs for iteration:
  - a **for**
  - b **while**
  - c **do...while**
- 13 use program constructs for selection:
  - a **if**
  - b **if...else**
  - c **switch**
- 14 use the break statement
- 15 use a method to refresh an applet on screen
- 16 output text to the screen.

## Underpinning knowledge

The candidate will be able to:

- 1 describe in simple terms the operation of software where discrete sections of code run in response to user-initiated events
- 2 describe the syntax for comments
- 3 state that a class is a template for an object
- 4 identify the structure of a class, its attributes and methods
- 5 describe the syntax for a method declaration, how its type is determined and its arguments specified
- 6 describe the logical and relational operators, the precedence rules for arithmetic and the effects of parenthesis
- 7 state limitations on the use of Java reserved words
- 8 describe the operation of iteration program constructs:
  - a **for**
  - b **while**
  - c **do...while**
- 9 describe the operation of selection program constructs:
  - a **if**
  - b **if...else**
  - c **switch**
- 10 state that the Abstract Windowing Toolkit (AWT) is a package of classes that implements most common User Interface (UI) components and also generates and manages events
- 11 describe the use of packages and the purpose of the import statement
- 12 describe applet security (read, write, delete, rename)
- 13 explain how an applet is loaded and initialised
- 14 describe how an applet is suspended and how an applet is removed from memory.



## **Unit 205**

### **Outcome 4**

## **Create software components using Java**

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 use available tools to identify errors
- 4 resolve logical and run-time errors found during testing.
- 5 provide evidence that the program complies with the specification
- 6 print the Graphical User Interface (screen images)
- 7 print listing of code.

### **Underpinning knowledge**

The candidate will be able to:

- 1 describe and distinguish 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 <b>Manage the development environment</b>	<input type="checkbox"/>	
2 <b>Use components to create a Graphical User Interface (GUI)</b>	<input type="checkbox"/>	
3 <b>Create code for a specified software component</b>	<input type="checkbox"/>	
4 <b>Test a software component and produce printed output.</b>	<input type="checkbox"/>	

**Candidate Signature** ..... **Date** .....

**City & Guilds**  
**Registration Number** ..... .....

**Centre Name** ..... **Centre Number** .....

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