# Systems and Principles Unit Syllabus

## Level 2 Creating an event driven computer program using Java

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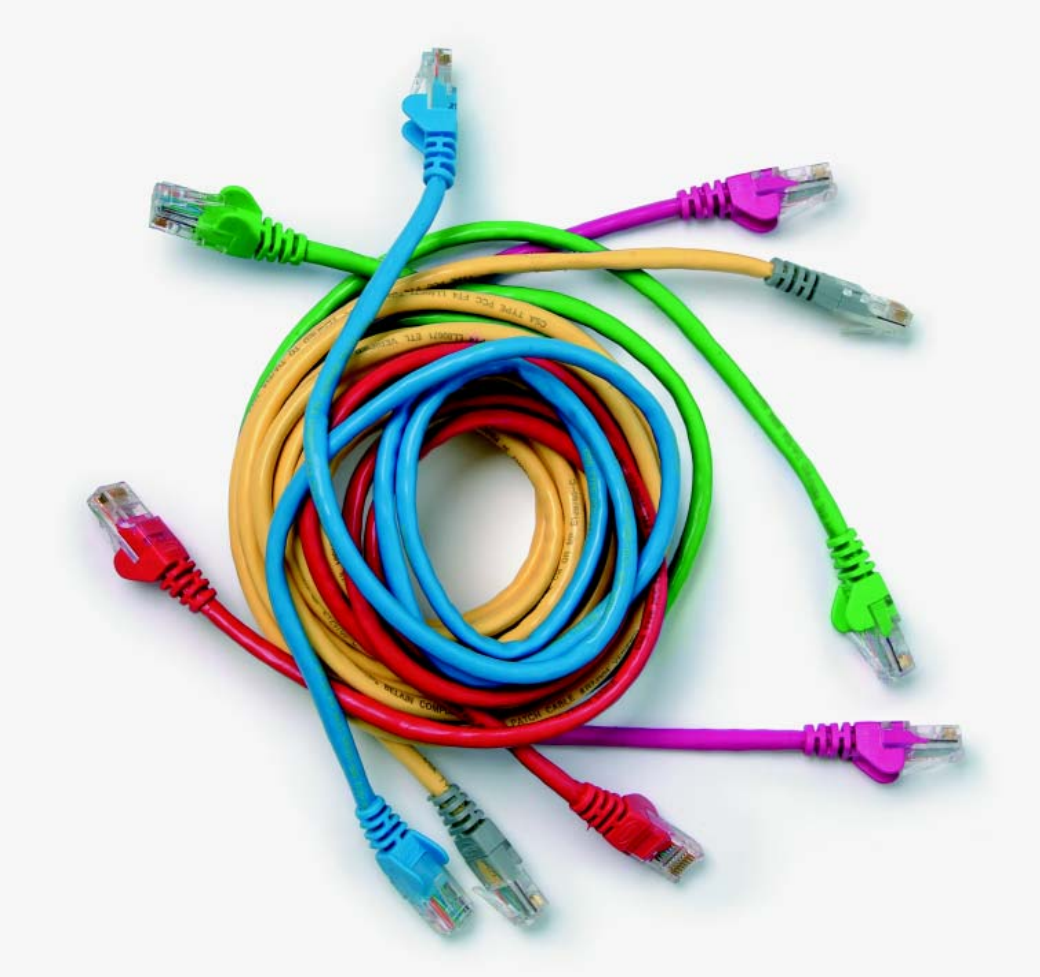

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# Unit 007 Creating an event driven computer program using Java

Syllabus Overview

**Unit accreditation number** **T/601/3177**

**Credit value** **7**

**Rationale**

This unit introduces the fundamental concepts of event driven computer languages and their use to implement, refine and test a computer program.

**Learning outcomes**

There are **three** outcomes to this unit. The candidate will:

- Implement software using event driven programming
- Refine an event driven program to improve quality
- Test the operation of an event driven program

**Guided learning hours**

It is recommended that **60** guided learning 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 learning outcomes and assessment criteria required for the level 2 Diploma in ICT Professional Competence.

**Assessment and grading**

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

# Unit 007 Creating an event driven computer program using Java

## Outcome 1 Implement software using event driven programming

**Practical activities**

The learner will be able to

1 declare and initialise variable and data structure types and sizes to implement given requirements
2 assign properties to screen components
3 associate events, including parameter passing, to screen components
4 implement event handling using control structures
5 declare file structures
6 use standard input/output commands to implement design requirements
7 use operators and predefined functions
8 use an Integrated Development Environment (IDE)

**Underpinning knowledge**

The learner will be able to

- describe the basic data types int, char, float and boolean
- state the difference between a variable and a constant
- explain the structure of a class, its attributes and methods
- describe how objects are created and manipulated
- explain how a user defined class can be created using extends
- describe how String, Font and Color objects can be manipulated
- explain how to draw lines, shapes and use different fonts and font styles
- describe how a one-dimensional array can be declared, initialised and accessed
- describe the use of packages and the purpose of the import statement
- describe the use of the following controls and their properties: Text field, Label, Text area, Check box, Radio button, Choice, List, Button, Frame, Menu
- state that a Panel is a container used for organising components
- describe how methods are used to manipulate a dialog
- state the difference between a modal and non-modal dialog
- describe how methods are used to manipulate components
- explain how images are loaded, displayed and scaled
- describe control structures used for selection ie if, if ... else, switch
- describe control structures for loops ie for, while, do … while
- describe applet security (read, write, delete, rename)
- describe the relational operators < (less than), > (greater than), <= (less than or equal to), >= (greater than or equal to), == (equal to), != (not equal to)
- describe the logical operators && (and), || (or), ! (not)
- describe the arithmetic operators ie + (add), - (subtract), * (multiply), / (divide)
- describe the assignment operator =
- explain how an applet is created, compiled and executed
- state the difference between a Java application and a Java applet
- explain how a HTML file can be created which contains a reference to a Java applet

# Unit 007 Creating an event driven computer program using Java

## Outcome 2 Refine an event driven program to improve quality

**Practical activities**

The learner will be able to

1 follow an agreed standard for naming, comments and code layout
2 implement data validation for inputs
3 implement error handling and reporting
4 create documentation for the support and maintenance of a computer program

**Underpinning knowledge**

The learner will be able to

- describe the conventional use of indentation in code layout
- state that meaningful names should be used for variables and constants
- state that meaningful comments are inserted in code to aid understanding of the code
- state that data validation is performed on data entered into a program to prevent incorrect data causing incorrect results or a run-time error
- describe the types of data validation that can be performed such as presence check, range check, date check, type check (alphabetic or numeric), character count, check digit (modulus number), format check (eg AG145), use of a lookup table for defined values
- state the importance of trapping errors in a program so that the program does not crash at run-time
- state the types of error that can cause a run-time error eg division by zero, reading past end of file, reading from or writing to a file that has not been opened
- describe how screen prompts are used to provide information to a user about the actions that can be taken when an error occurs
- state that the purpose of technical documentation is to help the software developer support and maintain the software
- describe the contents of technical documentation ie program specification program listing and test results

# Unit 007 Creating an event driven computer program using Java

## Outcome 3 Test the operation of an event driven program

**Practical activities**

The learner will be able to

1 use the debugging facilities available in the IDE
2 determine expected test results from given test data
3 compare actual results against expected results to identify discrepancies

**Underpinning knowledge**

The learner will be able to

- state that errors can be located when debugging a program by displaying the values held in variables
- state that test data should contain valid and invalid data
- state that testing is done to determine if a program executes correctly according to its specification and to aid in the location and correction of errors

# 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 Implement software using event driven programming** | ☐ | |
| **2 Refine an event driven program to improve quality** | ☐ | |
| **3 Test the operation of an event driven program** | ☐ | |

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

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

**Quality nominee (if sampled)** ..... **Date** .....

**Assessor Signature** ..... **Date** .....

**External Verifier Signature (if sampled)** ..... **Date** .....

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