Unit Title:	**Designing and Developing Event-Driven Computer Programs**
OCR unit number	11
Level:	4
Credit value:	15
Guided learning hours:	90
Unit reference number:	J/601/3300

Candidates undertaking this unit must complete real work activities in a work environment. Simulation is only allowed in exceptional circumstances (please refer to the centre handbook for further details).

Unit purpose and aim

To provide the learner with the skills and competencies to carry out the development of an event-driven computer program from design to testing in a professional capacity, and to understand a range of issues concerned with software development activities.

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
The Learner will: 1 Design event-driven programs to address loosely-defined problems	**The Learner can:** 1.1 Identify and structure the components and data required to address problems 1.2 Select and use pre-defined components, specialising as required 1.3 Identify the set of events that invoke behaviour of components and other programme elements 1.4 Specify the behaviour of components and other program elements to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms 1.5 Record the design using well-established notations	Candidates must have a detailed understanding of: • the structure, components and data required to address problems. • pre-defined components and their selection. • events and how they invoke behaviour of components and other program elements. • components and other program elements to: - allow efficient implementation - selecting appropriate file structures and algorithms • recording designs using well-established notations.

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
2 Produce a working event-driven program which meets the design specification	2.1 Make effective use of basic programming language features and programming concepts to implement a program that satisfies the design specification 2.2 Make effective use of the features of the programming environment 2.3 Make effective use of user interface components in the implementation of the program 2.4 Make effective use of a range of debugging tools	Candidates must have a detailed understanding of: • how to make effective use of programming language: - features - concepts • the features of the programming environment and how to use them effectively. • user interface components and how they are implemented. • the range of debugging tools.
3 Develop event-driven programs that reflect established programming and software engineering practice	3.1 Apply standard naming, layout and comment conventions 3.2 Apply appropriate data validation and error handling techniques	Candidates must have a detailed understanding of: The conventions for: • naming • layout • comments Data validation and error handling techniques and how they are applied.
4 Develop test strategies and apply these to event-driven programs	4.1 Develop and apply a test strategy consistent with the design identifying appropriate test data 4.2 Apply regression testing consistent with the test strategy 4.3 Use appropriate tools to estimate the performance of the program	Candidates must have a detailed understanding of: • devising and applying test strategies consistent with the design. • applying regression testing • the tools available to estimate the performance of a program
5 Develop design documentation for use in program maintenance and end-user documentation	5.1 Record the final state of the program in a form suitable for subsequent maintenance 5.2 Provide end-user documentation that meets the user's needs	Candidates must have a detailed understanding of the development of design documentation to support: • maintenance • end-user needs

Assessment

Candidates undertaking this unit must complete real work activities in order to produce evidence to demonstrate they are occupationally competent. Real work is where the candidate is engaged in activities that contribute to the aims of the organisation by whom they are employed, for example in paid employment or working in a voluntary capacity.

Simulation is only allowed for aspects of units when a candidate is required to complete a work activity that does not occur on a regular basis and therefore opportunities to complete a particular work activity do not easily arise. When simulation is used, assessors must be confident that the simulation replicates the workplace to such an extent that candidates will be able to fully transfer their occupational competence to the workplace and real situations.

Internal quality assurance personnel must agree the use of simulated activities before they take place and must sample all evidence produced through simulated activities.

It is the assessor's role to satisfy themselves that evidence is available for all performance, knowledge and evidence requirements before they can decide that a candidate has finished a unit. Where performance and knowledge requirements allow evidence to be generated by other methods, for example by questioning the candidate, assessors must be satisfied that the candidate will be competent under these conditions or in these types of situations in the workplace in the future. Evidence of questions must include a written account of the question and the candidate's response. Observations and/or witness testimonies must be detailed and put the evidence into context ie the purpose of the work etc.

All of the assessment criteria in the unit must be achieved and clearly evidenced in the submitted work, which is externally assessed by OCR.

Evidence for the knowledge must be explicitly presented and not implied through other forms of evidence.

Evidence requirements

All aspects of the assessment criteria must be covered and evidence must be available that shows where and how the assessment criteria have been achieved.

Assessment Criterion 1

For given, loosely-defined problems, candidates must design programs by:

- identifying and structuring the required components and data while selecting and using appropriate pre-defined components, specialising as required.
- identifying the set of events that invoke behaviour of components and other program elements
- specifying the behaviour of components and other program elements to allow efficient implementation and the selecting of appropriate data types, data and file structures and algorithms
- record the design using well-established notations and agreed documentation standards.

Assessment Criterion 2

Candidates must produce a working event-driven program which meets the design specifications for the given problems including:

- appropriate use of basic programming language features and programming concepts
- effective use of the features of the programming environment

- effective use of user interface components in the implementation of the program
- effective use of a range of debugging tools

Assessment Criterion 3

Candidates must, in developing their event-driven programs, provide evidence of:

- applying standard naming, layout and comment conventions
- applying appropriate data validation and error handling techniques

Assessment Criterion 4

Candidates must develop test strategies and apply them to the designed programs and document these to demonstrate:

- an appropriate test strategy and test data
- regression testing
- use of appropriate tools to estimate the performance of the program

Assessment Criterion 5

For each program the candidate must develop design documentation to support:

- maintenance
- end-user needs

Candidates are encouraged to choose activities which will allow them to cover all or a majority of the criteria at one time. It is not necessary to use different activities for each element of the criterion.

Guidance on assessment and evidence requirements

Evidence can reflect how the candidate carried out the process or it can be the product of a candidate's work or a product relating to the candidate's competence.

For example: The process that the candidate carries out could be recorded in a detailed personal statement or witness testimony. It is the assessor's responsibility to make sure that the evidence a candidate submits for assessment meets the requirements of the unit.

Questioning the candidate is normally an ongoing part of the assessment process, and is necessary to:

- test a candidate's knowledge of facts and procedures
- check if a candidate understands principles and theories *and*
- collect information on the type and purpose of the processes a candidate has gone through.
- candidate responses must be recorded

It is difficult to give a detailed answer to how much evidence is required as it depends on the type of evidence collected and the judgement of assessors. The main principles, however, are as follows: for a candidate to be judged competent in a unit, the evidence presented must satisfy:

- all the items listed, in the section 'Learning Outcomes'
- all the areas in the section 'Assessment Criteria'

The quality and breadth of evidence provided should determine whether an assessor is confident that a candidate is competent or not. Assessors must be convinced that candidates working on their own can work independently to the required standard.

You should refer to the '*Admin Guide: Vocational Qualifications* (A850)' for *Notes on Preventing Computer-Assisted Malpractice*.

Additional information

For further information regarding administration for this qualification, please refer to the OCR document '*Admin Guide: Vocational Qualifications' (A850)* on the OCR website www.ocr.org.uk .