

BTEC Nationals

IVA – LEARNER INSTRUCTIONS

Edexcel Level 3 BTEC National Certificate/Diploma

IT Practitioners (General)

Unit 9: Business IT Project

Unit 13: Database Management Systems

Issued July 2004

For use during the remainder of the duration of operation
of the specification issued May 2002



INSTRUCTIONS FOR LEARNERS COMPLETING IVAs

1. The Integrated Vocational Assignment (IVA) is a compulsory part of your qualification. If you do not complete the IVA you may not receive your certificate.
2. Your tutor(s) will tell you how long you have to complete the IVA and the access you may have to resources.
3. Read the IVA carefully and make sure that you understand the work you should hand in and what is required of you. If you are uncertain, discuss it with your tutor(s).
4. The IVA requires you to work by yourself and to produce original work. You should not share your work with any other learners. For example, if you produce an illustration or diagram electronically, you should not give it to another learner. Similarly, you should not accept and use such information from others. You are required to sign that the work submitted is your own.
5. If you work in a group at any stage, you must present your own responses to each task for assessment.
6. Information taken from sources for research, e.g. internet and textbooks, must be identified and not presented as your own work. You should list the sources used.
7. Some tasks may require Observation Records/Witness Statements. Your tutor(s) will organise for these to be completed and you must attach these to your submitted work.
8. In presenting your final work, you should not include draft work or reference materials such as handouts, notes and leaflets, unless the tasks specifically ask you to do so.
9. Presentation of your work:
 - Check that you have completed all tasks.
 - Label work with the appropriate task/sub task number.
 - Present tasks in the correct order.
 - Label each page with your name and page number.
 - Submit all electronic materials in paper format
 - Clearly label video or audio tapes submitted as part of your assignment.
 - All papers should be securely bound.
 - The completed IVA should NOT be presented in plastic envelopes, a box file or a lever arch file.

YOUR ASSIGNMENT TASKS

Part A: Unit 9 - Business IT Project

Context

In this part of the assignment you need to identify and examine a business problem, or problems, for which an IT project-based solution can be given. The problem(s) can be anything which results in an IT solution, and which can satisfy all of the assessment criteria. The problems could relate to database, web-based, programming, numerical modelling or any other area for which a project could be produced. Some ideas for projects are given below:

- A horticultural company needs a warranty system to claim for repairs undertaken on equipment that has had to be repaired within its warranty period (usually one year). The company will claim from the manufacturer by listing the serial number of the machine, a description of the work undertaken, and a list of parts that have been fitted during the warranty repair.
- A mobile children's library needs a system to record books that are loaned to a number of private nurseries in a small geographical area. A van travels between these nurseries, visiting each once a week, and loans them books that they will use with the children during the intervening week. Nurseries are able to reserve books if the book they want is not available on the van during the visit.
- A manufacturing company needs a system that will record training events undertaken by its employees. The system will initially be used to record the certification of Fork Lift Truck Drivers (who have to be tested every two years) and First Aiders (who have to be tested every three years). Some employees will be registered as both Fork Lift Truck Drivers and First Aiders. The system should record details of the training courses that employees have attended and be able to flag when a re-test is required.

Having identified a suitable problem for further research, select an appropriate solution and produce a project plan using appropriate planning software. You will then move on to implementation, testing the solution and evaluating its effectiveness.

The tasks below may be completed in any logical order for the project, but must be presented for verification in the order shown.

Task 1:

Investigation:

- a) Identify the problems that exist.
- b) Outline the possible solutions and requirements of the project (system framework, resources, constraints, etc).
- c) Provide a detailed analysis of the problem domain.

This task provides evidence for Unit 9 P2, P1, M1

Task 2:

Planning and design:

- a) Draw up a draft design which solves the problem(s), and justify your proposed solution. Your design must integrate at least one software application into the solution.
- b) Design the project solution. Include full details of items such as input, output, data stored, processing and testing
- c) Use appropriate planning models, tools and techniques to draw up a detailed plan of the project
- d) Show that you can use the project management software proficiently. Suitable evidence will include the work you have produced **and** an Observation Record from your tutor.

This task provides evidence for Unit 9 P3, P4, P5, D1, D2

Task 3:

Implementation and testing:

- a) Implement the project solution.
- b) Test the solution, providing detailed evidence of normal, erroneous and extreme tests. Testing should be based on the test plan you constructed in the design phase. Both interface and algorithmic tests should be undertaken, where appropriate.
- c) Throughout the project you must provide evidence that you have used appropriate applications software. (e.g. WP and 'drawing'/graphics for design and reports, project management for planning, suitable software application integrated into project solution).

Suitable evidence for the practical elements of this task may be provided by an observation statement backed up by screen shots, learner logs, learner notes, etc

This task provides evidence for Unit 9 P6, M3, M2

Task 4:

Reflection and evaluation:

- a) Produce a basic report outlining each stage of the project development. Include details of any problems you had with the development of the project and state briefly what you had hoped your project would achieve.
- b) Evaluate the project life cycle giving details of what went well and what went less well at each stage. Include suggestions of what you might change if you were to undertake another project.

NOTE: this evaluation is of the project, i.e. the different phases, how you managed it, and the processes involved. It is **not** an evaluation of the solution to the problem(s) identified.

This task provides evidence for Unit 9 P7, M4, D3

Part B: Unit 13 - Database Management Systems

Scenario

You are to assume the role of a database consultant working for a general computing consultancy, which has a number of clients representing diverse aspects of industry and commerce, most requiring training and design.

There are a number of requests pending action and you are to identify one of these for your project. Your activities with respect to the project are detailed in the tasks which follow.

You may select any project which interests you and you may take suitable data from any source for the practical aspects. Projects may be real or simulated. Read through the tasks thoroughly before starting.

Task 1:

Research database management systems and:

- Describe data models which are suitable for implementation within an RDBMS
- Distinguish between hierarchical, network and relational databases, including the ability of each to handle particular types of data models.

This task provides evidence for Unit 13 P1, D2

Task 2:

- a) Decide on the data requirements of a relational database and carry out normalisation on these requirements. The database should comprise at least three tables.
- b) Determine the type and size of all fields, and identify the key fields and relationships.
- c) Normalise to third normal form carefully documenting each stage of normalisation.
- d) Include a range of integrity constraints and data validation procedures in your design, such as:
 - Domain
 - Entity
 - Referential integrity
 - Operational constraints
 - Suitable validation procedures
 - Input masks

This task provides evidence for Unit 13 P2, P3, M1 M2

Task 3:

Produce an information sheet or short presentation on SQL. This should be suitable for use in training the administrators of the database, and include:

- The principles of SQL
- The function and purpose of data mining
- The structure of SQL e.g. DML, DDL and DCL
- The use of SQL by database administrators, users and application developers.
- A series of suitable SQL scripts for the system (including queries using more than one table and queries using Boolean expressions) with an explanation of their structure

This task provides evidence for Unit 13 P4, P5, M3

Task 4:

Finally, prepare an evaluative report or presentation for your manager on the success (or failure) of your database design. This should include such items as the success of your approach and whether it could have been improved if a different approach had been taken.

This task provides evidence for Unit 13 D1

ASSESSMENT CRITERIA

For ease of reference, the assessment criteria from the unit specifications that are relevant to assessing and grading this IVA are repeated below. You should refer to the full unit specification for information on unit content.

Assessment Evidence Unit

Unit 9: Business IT Project		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that the learner is able to:	To achieve a distinction grade the evidence must show that the learner is able to:
<ul style="list-style-type: none"> • outline the requirements of the project and the possible solutions • identify the problems that exist • draw up a draft solution design to satisfy the requirements of the project • state why this solution is proposed • design the project solution • implement the project solution • produce a basic report outlining each project phase. 	<ul style="list-style-type: none"> • provide a detailed analysis of the problem domain • use appropriate applications software at each stage of the project development • provide evidence to support detailed testing • produce a detailed report outlining all stages of the development, problems encountered and project expectations. 	<ul style="list-style-type: none"> • use appropriate planning models, tools and techniques • show evidence of using project management software proficiently • provide an evaluation of the project life cycle.

ASSESSMENT CRITERIA

For ease of reference, the assessment criteria from the unit specifications that are relevant to assessing and grading this IVA are repeated below. You should refer to the full unit specification for information on unit content.

Assessment Evidence Unit

Unit 13: Database Management Systems		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that the learner is able to:	To achieve a distinction grade the evidence must show that the learner is able to:
<ul style="list-style-type: none"> research data models suitable for implementation in an RDBMS carry out normalisation techniques design a relational database understand the principles of SQL describe the function and purpose of data mining. 	<ul style="list-style-type: none"> use the three levels of normalisation and careful documentation to show the development of a relational database design from a complex model design a relational database to include a range of integrity constraints and data validation procedures write SQL scripts, understand the structure of the SQL language and the use of that structure by database administrators, users and application developers. 	<ul style="list-style-type: none"> provide a detailed evaluation of the relational database design in the form of a report or presentation distinguish between different types of DBMS by reference to the ability of each type to handle particular types of data model.