-SQA-SCOTTISH QUALIFICATIONS AUTHORITY

HIGHER NATIONAL UNIT SPECIFICATION

GENERAL INFORMATION

-Unit Number-   **8412475**

-Superclass-   **CB**

-Title-   **DATA ANALYSIS AND DATABASE DESIGN**

-DESCRIPTION-

GENERAL COMPETENCE FOR UNIT: Apply data analysis techniques in the design of systems and using a database management system to implement the designed system.

OUTCOMES

1.   construct logical data models for existing systems;

2.   normalise data sources to third normal form;

3.   design database structures to model given problems.

CREDIT VALUE: 1 HN Credit

ACCESS STATEMENT: There is no formal entry requirement for this unit. However, it is essential that the candidate has prior experience of using a computer system. This may be evidenced by the possession of relevant NC modules, HN units or practical experience.

For further information contact: Committee and Administration Unit, SQA, Hanover House, 24 Douglas Street, Glasgow G2 7NQ.

Additional copies of this unit may be purchased from SQA (Sales and Despatch section). At the time of publication, the cost is £1.50 (minimum order (£5.00).

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STATEMENT OF STANDARDS

UNIT NUMBER: 8412475

UNIT TITLE: DATA ANALYSIS AND DATABASE DESIGN

Acceptable performance in this unit will be the satisfactory achievement of the standards set out in this part of the specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

OUTCOME

   1.   CONSTRUCT LOGICAL DATA MODELS FOR EXISTING SYSTEMS

PERFORMANCE CRITERIA

   (a)   All primary entities are accurately identified.
   (b)   All relationships between entities are accurately determined.
   (c)   Logical Data Model diagram correctly shows all relationships.
   (d)   Descriptions are complete and accurate.

RANGE STATEMENT

Descriptions: data item; entity.

Entities: obligatory; non-obligatory.

Relationships: 1 to 1; 1 to many; many to many.

EVIDENCE REQUIREMENTS

Performance evidence that the candidate can construct Logical Data Models from narrative descriptions of real systems as specified in PCs (a) to (d). This may be provided by two or more Logical Data Models of systems involving a total of at least 8 entities.

OUTCOME

2. NORMALISE DATA SOURCES TO THIRD NORMAL FORM

PERFORMANCE CRITERIA

(a) Repeating groups are correctly removed from data structures.
(b) Appropriate unique keys are chosen for all data structures.
(c) Partial dependencies are correctly removed from data structures.
(d) Transitive dependencies are correctly removed from data structures.
(e) Data Model Diagram accurately represents normalised structures.

RANGE STATEMENT

Range for this outcome is fully expressed within the performance criteria.

EVIDENCE REQUIREMENTS

Performance evidence that the candidate can normalise data sources to Third Normal Form as specified in PCs (a) to (e). This may be provided by the normalised data structures (for PCs (a) to (d)) and Data Model Diagrams (for PC (e)) of the systems used in achieving Outcome 1.

OUTCOME

3. DESIGN DATABASE STRUCTURES TO MODEL GIVEN PROBLEMS

PERFORMANCE CRITERIA

(a) Identification of the tasks required by the model is complete and accurate.
(b) Construction of required Logical Data Model is accurate.
(c) Designed data structures accurately represent the model.
(d) Field names and characteristics are appropriate to the model.

RANGE STATEMENT

Field characteristics: size; type (integer, real, character and date); key; required.

EVIDENCE REQUIREMENTS

Performance evidence that the candidate can design database structures as detailed in PCs (a) to (d). This should be provided by the data models and data structure designs or the systems normalised in achieving Outcome 2.

MERIT   A candidate who achieves all performance criteria for all outcomes will be awarded a pass. A pass with merit may be awarded where the candidate demonstrates superior performance by:

-        designing a database structure for a complex system; or
-        producing database structures for a diverse range of systems.

ASSESSMENT

In order to achieve this unit, candidates are required to present sufficient evidence that they have met all the performance criteria for each outcome within the range specified. Details of these requirements are given for each outcome. The assessment instruments used should follow the general guidance offered by the SQA assessment model and an integrative approach to assessment is encouraged. (See references at the end of support notes).

Accurate records should be made of the assessment instruments used showing how evidence is generated for each outcome and giving marking schemes and/or checklists, etc. Records of candidates' achievements should be kept. These records will be available for external verification.

SPECIAL NEEDS

Proposals to modify outcomes, range statements or agreed assessment arrangements should be discussed in the first place with the external verifier.

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SUPPORT NOTES

UNIT NUMBER: 8412475

UNIT TITLE: DATA ANALYSIS AND DATABASE DESIGN

SUPPORT NOTES: This part of the unit specification is offered as guidance. None of the sections of the support notes is mandatory.

NOTIONAL DESIGN LENGTH: SQA allocates a notional design length to a unit on the basis of time estimated for achievement of the stated standards by a candidate whose starting point is as described in the access statement. The notional design length for this unit is 40 hours. The use of notional design length for programme design and timetabling is advisory only.

PURPOSE   This unit has been designed to provide data analysis skills for candidates undertaking HNC/D programmes. For computing candidates it can be integrated with systems development units or unit 8412445 Applications Development.

CONTENT/CONTEXT   This unit is intended to concentrate on the analysis of data and design of databases as opposed to the use of database packages and consideration should be given to delivering this unit in conjunction with either programming or database usage units. Coverage should therefore be limited to the analysis and design aspects of the subject.

The term 'database structure' is used to mean the overall data representation of the system ie. will typically include multiple 'data structures' containing groups of fields. 'Data structures' will, depending on software used, be files, tables or similar constructs.

The systems to be designed should be relatively simple but realistic (suggested examples include: stock control, order processing, library or video rental and an appointment system) and should relate to a range of vocational areas.

APPROACHES TO GENERATING EVIDENCE   A candidate-centred, resource-based learning approach is recommended.   During the course of the unit candidates should have several opportunities to develop their practical skills and should be assessed at appropriate points. Concepts and terminology should be presented in context throughout the unit.

Where the candidate is unsuccessful in achieving an outcome provision should be made for remediation and reassessment.

ASSESSMENT PROCEDURES   Centres may use the instruments of assessment which are considered by the tutor/trainer to be the most appropriate. Examples of instruments of assessment which could be used are:

- practical exercises
- log books
- assignments

PROGRESSION   This unit contributes towards SQA Higher National Certificates, Higher National Diplomas and professional Development Awards.

REFERENCES

1. Guide to unit writing.
2. For a fuller discussion on assessment issues, please refer to SQA's Guide to Assessment.
3. Information for centres on SQA's operating procedures is contained in SQA's Guide to Procedures.
4. For details of other SQA publications, please consult SQA's publications list.

A support pack for this unit is available from SQA. Please call our Sales and Despatch section on 0141 242 2168 to check availability and costs. Quote product code C097.