Unit 131: Designing Database Solutions and Data Access Using Microsoft SQL Server 2008 (70-451)

Unit code: A/600/4299

QCF Level 4: BTEC Higher National

Credit value: 10

Guided learning hours: 54

Aim and purpose

Candidates for this exam typically work in an enterprise environment that has more than 500 personal computers and more than 100 servers and mostly create solutions for all types of enterprise issues. Candidates should have experience with the following:

- Writing transact SQL queries
- Programming the database
- Troubleshooting programming objects (for example, stored procedures, triggers, user-defined functions [UDFs], user-defined types [UDTs], and queries)
- Database performance tuning and optimization
- Designing databases at both the conceptual and logical levels
- Implementing databases at the physical level
- Might be involved in designing and troubleshooting the data access layer of the application
- Gathering business requirements

Unit introduction

This unit is a comprehensive exploration of the core principles of Microsoft Server technologies. This is one of the many units in the Microsoft Information Technology professional study pathway, leading to the MCITP qualification. This unit focuses on database design and development, with reference to the Microsoft version of SQL technologies.

The unit covers networking sector skills and knowledge that a software or web developer would need to successfully complete their work. In particular, learners will be taught how to design a database strategy, tables, programming objects, transactions and concurrency along with XML. An essential component of the learning will also cover database query performance and optimisation for high volume systems.

This unit involves hands-on, lab-oriented activities that stresses laboratory safety and working effectively in a group environment. Theory aspects are studied and tested online using material from Microsoft's learning partners, which learners may also access from home are read in text books. The course is delivered through

a blended learning approach where tutor-led teaching is combined with paper-based as well as electronic materials and testing.

This unit is assessed via the Designing Database Solutions and Data Access Using Microsoft SQL Server 2008 (70-451) online examination. There are further criteria for merit and distinction grades.

Learning outcomes

On completion of this unit a learner should:

1 Design a Database Strategy

2 Design Database Tables

3 Design Programming Objects

4 Design a Transaction and Concurrency Strategy

5 Design an XML strategy

6 Design Queries for Performance

7 Design a Database for Optimal Performance.

Unit content in relation to the Merit and Distinction Criteria

Database environment: types eg server used, database design, current transaction time, database size

SQL database: types eg T-SQL, design views, CLR table and scalar functions, database tables, search requirements,

Current standards: types eg database design, normalisation, XML standards,

Benchmark data: types eg query performance, indexing performance, compression, query tuning, access rate, number of queries per time period, time to write

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
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, in addition to the pass criteria, the learner is able to:**	**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**
Pass Designing Database Solutions and Data Access Using Microsoft SQL Server 2008 (70-451) The centre will evidence this with a copy of the learners results, the learner MUST PASS at the minimum set by Microsoft.	**M1** research an existing database environment and evaluate current performance	**D1** justify database design against current standards
	M2 design an SQL database	**D2** research performance of database and provide benchmark data.
	M3 manage the development of a SQL database.	

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key			
	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Designing Database Solutions and Data Access Using Microsoft SQL Server 2008 (70-451)is a proprietary certification within the Microsoft IT academy programme. Access to resources, curriculum, assessment and support materials are available only to institutions participating in the program.

If learners are following the Microsoft certification in parallel with a BTEC National or Higher National then it is recommended that the two aspects of the assessment are integrated. Tasks being completed as part of the practical preparation for Microsoft Certification can then be used to support the BTEC assessment for the merit and distinction criteria.

To view general information about Microsoft objectives please visit: https://www.microsoft.com/education/MSITAcademy/default.mspx where the detailed scope and sequence for all certifications are available for anyone to download.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

The learning outcomes associated with this unit are closely linked with:

Level 3	Level 4	Level 5
Unit 6: Software Design and Development	Unit 17: Database Design Concepts	Unit 33: Data Analysis and Design
Unit 14: Event Driven Programming	Unit 18: Procedural Programming	Unit 35: data structures and algorithms
Unit 15: Object Oriented Programming	Unit 19:Object Oriented Programming	All level 5, Microsoft IT professional units
Unit 16: procedural programming	Unit 20:Event Driven Programming Solutions	
Unit 18: database design	All level 4, Microsoft IT professional units	
Unit 21: Data Analysis and Design		
All level 3, Oracle Units		
All level 3, Microsoft IT professional units		

This unit has links to the Level 4 and Level 5 National Occupational Standards for IT and Telecoms Professionals, particularly the areas of competence of:

- Data Analysis
- Software Development.

Essential Requirements

Learners must have access to a live or 'detached' network environment to create the client/server and programming environment develop their skills; this may be successfully accomplished using virtual machines.

Learners must have access to facilities, which allow them the opportunity to fully evidence all the criteria of the unit. If this cannot be guaranteed then centres should not attempt to deliver this unit.

Evaluation of current systems and solutions, commercial practices, social conditions and the culture surrounding the system in use is of as much importance as delivering work supporting potential understanding of the technological systems and the services they offer.

Learners must have access to a range of suitable hardware as it is important to undertake as many practical activities as possible to reinforce theoretical learning. There are many virtual, emulated and simulated systems that now support delivery.

Resources

Books

Microsoft in association with their many partners produce a range of books on the topics in this module, please refer to the Microsoft Academy resource for the latest information.

Websites

www.microsoft.com

www.microsoft.com/education/msitacademy/default.mspx

Employer engagement and vocational contexts

The Microsoft ITP certification is internationally recognized by a diverse range of employers (from SME's to large corporations) as one of the principal certifications in SQL database development.