

# **BCS Higher Education Qualifications**

## **Level 6 Advanced Database Management Syllabus**

Version 4.0

December 2016

This is a United Kingdom government regulated qualification which is administered and approved by one or more of the following: Ofqual, Qualification in Wales or SQA.

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## 1. Change History

Any changes made to the syllabus shall be clearly documented with a change history log. This shall include the latest version number, date of the amendment and the changes made. The purpose is to identify quickly what changes have been made.

Version Number	Date	Changes Made
V1.0	March 2014	Released
V 2.0	March 2015	Re-formatted with syllabus numbering – no change to content
V 3.0	March 2015	Includes new architectures e.g. NoSQL
V4.0	Dec 2016	Regulation statement added

## 2. Rationale

This module provides a detailed insight into implementation aspects of relational systems and tests the candidates' knowledge of the current enhancements to relational database systems, object oriented database and XML database systems.

## 3. Aims

- To evaluate emerging architectures for database management systems
- To develop an understanding of the manner in which relational systems are implemented and the implications of the techniques of implementation for database performance
- To assess the impact of emerging database standards on the facilities which future database management systems will provide.

## 4. Objectives

Upon successful completion of this module, candidates will be able to demonstrate their competence in, and their ability to:

- Critically assess new developments in database technology
- Interpret and explain the impact of emerging database standards
- Evaluate the contribution of database theory to practical implementations of database management systems.

## 5. Prior Knowledge Expected

### Professional Graduate Diploma in IT

The learner must have achieved the Diploma in IT or have an appropriate exemption to be entered for the Professional Graduate Diploma in IT.

Candidates are required to become a member of BCS, The Chartered Institute for IT to sit and be awarded the qualifications. Candidates may apply for a four-year student membership that will support them throughout their studies.

## 6. Format and Duration of the Examination

### Professional Graduate Diploma in IT

The examination is a three-hour closed book examination (no materials can be taken into the examination room) based on the syllabus in this document.

Examinations are held twice a year and are undertaken in normal examination conditions with one or more duly appointed invigilators.

The pass mark is 40%.

## 7. Syllabus Detail

Category	Ref	Content
1	1.1	Theoretical concepts
	1.2	Relational model conformity and Integrity
2	2.1	Advanced SQL programming
	2.2	Query optimisation
	2.3	Concurrency control and Transaction management
	2.4	Database performance tuning
	2.5	Distributed relational systems and Data Replication
	2.6	Security considerations
3	3.1	Object oriented, deductive, spatial, temporal and constraint database management systems
	3.2	New database applications and architectures: e.g. Data Warehousing; Multimedia; Mobility; Multidatabases; NoSQL, Native XML databases (NXD), Internet
4	4.1	SQL standards, SQL 1999, SQL:2003
	4.2	Object Data Management Group (ODMG) version 3.0 standard
	4.3	Standards for interoperability and integration e.g. Web Services, SOAP
	4.4	XML related specifications, e.g. XQuery, XPath.

## 8. Recommended Reading List

Advanced Database Management Systems	ISBN 10	ISBN 13
<b>Primary Texts</b>		
• Date C. J., An Introduction to Database Systems, Addison-Wesley Longman (8th Ed), 2003	0321197844 0321189566	978-0321197849 978-0321189561
• Catell, R.G.G., Barry, D.K., Berler, M., et al, The Object Data Standard: ODMG 3.0, Morgan Kaufmann, 2000.	1558606475	978-1558606470
• Silberschatz A., Korth H., and Sudarshan S., Database System Concepts, McGraw-Hill (6th Ed), 2010	0073523321	978-0073523323
• Charles F. Goldfarb, Paul Prescod, The XML Handbook, Prentice Hall, (5th ed), 2004.	0130497657	978-0130497659
• Thomas M. Connolly, Carolyn Begg, Database Systems: practical approach to design, implementation, and management, Pearson Education Limited, (6th edition),2015	1292061189	978-1292061184
<b>Other Reading</b>		
Melton, J., & Simon A., SQL 1999, Understanding Relational Language Components, Morgan-Kaufmann, 2003.	1558604561	978-1558604568

## 9. Contact Points

- Email:** Customer Service team via [www.bcs.org/contact](http://www.bcs.org/contact)
- Phone:** UK: 01793 417424 or 0845 300 4417 (lo-call rate)  
Overseas: +44 (0)1793 417424  
Lines are open Monday to Friday, 08.15 a.m. to 5.45 p.m. UK time.
- Website:** [www.bcs.org/heg](http://www.bcs.org/heg)
- Post:** BCS, The Chartered Institute for IT  
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