PROFESSIONAL GRADUATE DIPLOMA IN IT SYLLABUS

Advanced Database Management Systems

Your route to becoming a Chartered IT Professional

Database management systems are standard tools that enable the storage and retrieval of data within modern information systems. Units introducing database concepts are now an accepted part of most computer science courses. These introductory units tend to concentrate on the use of relational database systems. This advanced module, in contrast, deals with 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.

Aims

- Compare and contrast emerging architectures for database management systems
- Understand the manner in which relational systems are implemented and the implications of the techniques of implementation for database performance
- Appreciate the impact of emerging database standards on the facilities which future database management systems will provide

Objectives

- 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

Prior Knowledge Expected

Candidates are expected to be familiar with the materials covered in the Certificate syllabuses and the Diploma Database Systems syllabus.

Content:

The Relational Model of Data

Theoretical concepts
Relational model conformity and Integrity

Relational Database Management Systems Implementation Techniques

Advanced SQL programming

Query optimisation

Concurrency control and Transaction management

Database performance tuning

Distributed relational systems and Data Replication

Security considerations

Emerging Database Management System Technologies

Object oriented, deductive, spatial, temporal and constraint database management systems

New database applications and environments: e.g. Data Warehousing; Multimedia; Mobility; Multidatabases; Native XML databases (NXD), Internet

Database and Related Standards

SQL standards, SQL 1999, SQL:2003
Object Data Management Group (ODMG) version 3.0 standard

Standards for interoperability and integration e.g. Web Services, SOAP

XML related specifications, e.g. XQuery, XPath.

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Primary Texts:

Date C. J., An Introduction to Database Systems, Addison-Wesley Longman (8th Ed), 2003, ISBN: 0321189566

Catell, R.G.G., Barry, D.K., Berler, M., et al, The Object Data Standard: ODMG 3.0, Morgan Kaufmann, 2000, ISBN: 1558606475

Silberschatz A., Korth H., and Sudarshan S., Database System Concepts, McGraw-Hill (5th Ed), 2006, ISBN: 0072958863

Charles F. Goldfarb, Paul Prescod, The XML Handbook, Prentice Hall, (5th ed), 2004, ISBN: 0-13-049765-7

Other Reading:

Melton, J., & Simon A., SQL 1999, Understanding Relational Language Components, Morgan-Kaufmann, 2003, ISBN: 1558604561

Melton J., Advanced SQL: 2001, Understanding Object-relational and other Advanced Features, Morgan-Kaufmann, 2003, ISBN: 1558606777

The World Wide Web Consortium – W3C recommendations, www.w3c.org

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