

## Liverpool John Moores University

Title: DATABASE DESIGN AND TECHNOLOGY  
Status: Definitive  
Code: **7127COMP** (122195)  
Version Start Date: 01-08-2021

Owning School/Faculty: Computer Science and Mathematics  
Teaching School/Faculty: Computer Science and Mathematics

Team	Leader
Dhiya Al-Jumeily	Y
Abir Hussain	

**Academic Level:** FHEQ7      **Credit Value:** 20      **Total Delivered Hours:** 33  
**Total Learning Hours:** 200      **Private Study:** 167

### Delivery Options

Course typically offered: Semester 2

Component	Contact Hours
Lecture	11
Practical	11
Tutorial	11

**Grading Basis:** 50 %

### Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Report	AS1	Relational database design and evaluation.	50	
Report	AS2	Survey paper of selected research topics.	50	

### Aims

*To examine critically selected techniques for modelling the data requirements of database applications at the conceptual level.*

*To develop and understand contemporary advanced issues of database design, with specific interest in the context of business intelligence.*

*For example how core concepts in databases may be applied and developed to solve research problems such as handling Big Data and Temporal Data. To develop an informed appreciation of significant, current issues and trends in database systems.*

## **Learning Outcomes**

After completing the module the student should be able to:

- 1 Apply a range of conceptual data modelling techniques for the specification of data requirements and be able to select from among them those which are most appropriate to given application problems.
- 2 Apply advanced principles of the relational database model, data integrity and functional dependency to logical data design problems.
- 3 Explain and evaluate in detail how advanced large-scale database systems support business intelligence.
- 4 Critically evaluate the principles, problems and contributions of distributed database systems, object-oriented databases and further research topics in database systems.

## **Learning Outcomes of Assessments**

The assessment item list is assessed via the learning outcomes listed:

Design and evaluation	1	2
Survey paper	3	4

## **Outline Syllabus**

*Relational design and relational technology - DBMS architecture – functional dependency and normalisation (review) - approaches to lossless join, dependency preserving decomposition, normalization to BCNF - multivalued and join dependencies - 4NF, 5NF. - SQL standards. -Security, integrity, transaction management and recovery - file organisations - query processing - view processing - host and embedded languages.*

*Current issues and trends - distributed database management: distributed databases, locking, Business Intelligence Alternate DBMS / Big Data, commitment and concurrency.*

*Object-oriented databases: the object-oriented model - origins of object-oriented database languages - persistence - example OODB implementations and implementation considerations - modelling and design for OODBs. Object database standards. Object-relational model.*

*Research issues – data warehousing - data mining and business intelligence – Web searches – Big Data- Semantic Web.*

## **Learning Activities**

Formal lectures will introduce core topics.  
Tutorials and in-class group activities will provide exercises to develop skills.  
Practical exercises using relational and object related databases.

## **Notes**

This module examines recent developments and current trends in databases both from the application and the technology view points.