Module Title:	Advanced Database Systems
Language of Instruction:	English

Credits:	10

NFQ Level:	8

Module Delivered In	No Programmes

Teaching & Learning Strategies:	The course is taught by means of lectures and supervised practicals. The practical work consists of 9 laboratory assignments. All assignments will focus on three large DBMSs. The laboratory exercise topics (installation, configuration, maintenance, data analysis, etc) are designed to fully explore the features of each package and to compare packages.

Module Aim:	To broaden the student's theoretical and practical knowledge of the design, operation and administration of modern large database systems.

Learning Outcomes
On successful completion of this module the learner should be able to:

LO1	Set up and administer large database systems
LO2	Understand the importance of data management within a modern organization
LO3	Appreciate the difficulties inherent in integration of heterogeneous data sources
LO4	Evaluate developments and trends in database systems
LO5	Understand the functionality available in modern DBMS software and how to compare competing packages

Pre-requisite learning
Module Recommendations This is prior learning (or a practical skill) that is recommended before enrolment in this module.
No recommendations listed
Incompatible Modules These are modules which have learning outcomes that are too similar to the learning outcomes of this module.
No incompatible modules listed
Co-requisite Modules
No Co-requisite modules listed
Requirements This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.
No requirements listed

Module Content & Assessment

Indicative Content

1. Oracle, SQL Server, MySQL
Architecture, physical & logical structure

2. Database Maintenance
Backup & Recovery; import-export, log files, indexing, database integrity

3. Database Applications
SQL, ODBC, XML, stored procedures, database connections, database app security

4. Database Performance
Normalization, catalog, query optimizer, contention, security & authorization, physical database design & tuning, monitoring & tuning

5. Object-Oriented Database
OO concepts, distributed objects, object models, Java, OODB, Multimedia databases

6. Data Warehousing
OLAP, dimensions, measures, roll-up/drill-down, dimension & fact tables, star schema, data warehouse, data mart, materialized view

7. Data Analytics
market basket analysis, classification, association rules, clustering, decision trees, regression, neural nets, genetic algorithms, big data, total data

8. Data Management in the Cloud
DaaS, DBaaS, Cloud-based DBMS Services, Security, AWS, EMC, Azure

9. Next Generation Database Systems
Mobile, Temporal, Biological & Sensor Databases Digital Libraries, Spatial data, Unstructured Data, NoSQL, NewSQL, Hadoop

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	30.00%
End of Module Formal Examination	60.00%

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	Class Tests; Theory Assignments (e.g. problem sheets, literature surveys, etc)	2,3,4	10.00	n/a

No Project

Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	9 laboratory assignments	1,3,5	30.00	Sem 1 End

End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	No Description	1,2,3,4,5	60.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
Workload Type	*Frequency*	*Average Weekly Learner Workload*
Lecture	30 Weeks per Stage	2.00
Laboratory	30 Weeks per Stage	2.00
Independent Learning Time	30 Weeks per Stage	2.67
	Total Hours	200.00