H8IDA: Introduction to Data Analytics

Module Code:	H8IDA
Long Title	Introduction to Data Analytics APPROVED
Title	Introduction to Data Analytics
Module Level:	LEVEL 8
EQF Level:	6
EHEA Level:	First Cycle
Credits:	10
Module Coordinator:	EUGENE O'LOUGHLIN
Module Author:	Helen Power
Departments:	
Specifications of the qualifications and experience required of staff	

Learning Outcomes	
On successful completion of this module the learner will be able to:	
#	**Learning Outcome Description**
LO1	Capture requirements for appropriate data storage technologies
LO2	Design and Implement effective data models
LO3	Investigate and implement dataset pre-processing techniques
LO4	Investigate and utilise relational and non-relational databases for optimised storage, retrieval, and organisation of data
LO5	Use data warehousing and online analytical processing techniques

Dependencies
Module Recommendations
No recommendations listed
Co-requisite Modules
No Co-requisite modules listed

Entry requirements	

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Module Content & Assessment

Indicative Content

1. Databases and Storage (25%)
• Collecting Data • Data Storage • Data Modelling • Normalisation • Indexes • Relational Databases • DBMS File Management • Tuning at the Internal level • Indexing and Hashing • Query processing and optimisation • Database Performance Evaluation

2. SQL for Data Retrieval (30%)
• Outputting Data Streams • Complex Joins/Multi-Joins • Sub/Correlated Queries • Views • Integrity Enhancement Features of SQL • Advanced Data Definition

3. Non-relational Databases (10%)
• Types of non-relational databases • Storing and retrieving information • Algorithmic based queries • Distributed data storage • Cloud-based data storage

4. Data Warehousing (35%)
• Introduction to Data Warehousing • Data Warehousing Concepts • Types of Data Warehouse • Designing a Data Warehouse Database • Building a Data Warehouse • Using a Data Warehouse • On-line analytical processing (OLAP) • Data-mining • Administering a Data Warehouse • Challenges of Data Warehousing

Learning Environment
Learning will take place in classroom or lab environments as appropriate. In lab environments, each student will have access to a PC with a database. Learners will have access to library resources and to faculty outside of the classroom where required. Module materials will be placed on Moodle, the college's LMS. Labs The labs will concentrate on implementing and manipulating data for analysis, and how best to implement the theory learned during the module.

Assessment Breakdown	%
Coursework	50.00%
End of Module Assessment	50.00%

Assessments

Full Time

Coursework

Assessment Type:	Written Report	**% of total:**	25
Assessment Date:	n/a	**Outcome addressed:**	1,2,3,4,5
Non-Marked:	No		

Assessment Description:
Learners must prepare a literary review and analysis covering specific optimisation techniques applied by corporate database vendors.

Assessment Type:	Practical (0260)	**% of total:**	25
Assessment Date:	n/a	**Outcome addressed:**	1,2,3,4,5
Non-Marked:	No		

Assessment Description:
a. Learners will be presented with an organisations data requirement and expected output objectives, designed to cover the range of data storage and retrieval functions on the syllabus. b. From this information, learners will be required to design and implement a data model complete with large amounts of data. From this create a data warehouse model and provide the complete reporting data set. (25%). ** It should be noted that learners can use their own predefined datasets to create the data warehouse for practical assessment as this may be advantageous to the learning.

End of Module Assessment

Assessment Type:	Terminal Exam	**% of total:**	50
Assessment Date:	End-of-Semester	**Outcome addressed:**	1,2,3,4,5
Non-Marked:	No		

Assessment Description:
End-of-Semester Final Examination

No Workplace Assessment

Reassessment Requirement

Repeat examination
Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element.

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Module Workload

Module Target Workload Hours 0 Hours

Workload: Part Time

Workload Type	*Workload Description*	*Hours*	*Frequency*	*Average Weekly Learner Workload*
Lecture	No Description	2	Every Week	2.00
Tutorial	No Description	2	Every Week	2.00
			Total Weekly Contact Hours	4.00

Module Resources

Recommended Book Resources

Thomas M. Connolly, Carolyn E. Begg. Database systems, Fifth Edition. Boston ; Addison-Wesley, c2010., [ISBN: 0321523067].

Supplementary Book Resources

Gordon S. Linoff. Data Analysis Using SQL and Excel, Wiley, [ISBN: 0470099518].

Eric Redmond, Jim Wilson. Seven Databases in Seven Weeks, Pragmatic Bookshelf, [ISBN: 1934356921].

Baron Schwartz, Peter Zaitsev, Vadim Tkachenko. High Performance MySQL, O'Reilly Media, [ISBN: 1449314287].

This module does not have any article/paper resources

Other Resources

[Website], http://www.thearling.com.

[Website], http://www.mongodb.org.

[Website], http://www.mysql.com.

Discussion Note:	