H9DATA: Data Analytics

Module Code:	H9DATA
Long Title	Data Analytics APPROVED
Title	Data Analytics
Module Level:	LEVEL 9
EQF Level:	7
EHEA Level:	Second Cycle
Credits:	10
Module Coordinator:	Simon Caton
Module Author:	EUGENE O'LOUGHLIN
Departments:	School of Computing
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	Analyse and evaluate large data sets
LO2	Extract, transform, and load data to interpret value
LO3	Create strong analytical predictive models
LO4	Transform information from data analysis for human perception, cognition, and communication through data analysis and visualization

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
Introduction to Data Analytics • History and context of big data • Examples of big data • Data analytics articulated • Data analytics technology landscape
Exploratory Data Analysis • Data Types • Numeric/non-numeric data • Data Hierarchy • Databases • Querying databases • Data mining • Statistical analysis
Data preparation • Normalization and standardization • Basic transformations of value types • Handling missing values • Outliers • Data sampling • Joins • Aggregation • Changing value types • Balancing data
Predictive Models • Correlations • k-Nearest neighbour analysis • Predictive data mining • Generalized linear regression models • Model evaluation • Decision trees
Time Series Analysis Frequency-domain methods; Time-domain methods; Seasonal cycles (e.g. Holt-Winters exponential smoothing)
Data visualization • Data visualization tools • Infrastructure for data visualization • Charts/Graphs • KPI Dashboards • Interactive data visualization

Assessment Breakdown	%
Coursework	100.00%

Assessments

Full Time

Coursework

Assessment Type:	Continuous Assessment	**% of total:**	25
Assessment Date:	n/a	**Outcome addressed:**	1
Non-Marked:	No		

Assessment Description:
In-class test 1: Learners will analyse and evaluate a financial data set to generate reports such as descriptive statistics and charts to represent the data.

Assessment Type:	430	**% of total:**	25
Assessment Date:	n/a	**Outcome addressed:**	2
Non-Marked:	No		

Assessment Description:
In-class test 2: Learners will be provided with a database file in order to extract, transform, and load (ETL) data to interpret value and answer specific questions about the data.

Assessment Type:	Project	**% of total:**	50
Assessment Date:	Sem 1 End	**Outcome addressed:**	1,2,3,4
Non-Marked:	No		

Assessment Description:
Project Learner projects will be an investigation into large data sets. Data are to be analysed with a view to generating a detailed report on how these data can be used to inform decision-making and to add value to a business. Learners will be free to choose their own data sets from either on-line resources or to generate their own data. Datasets selected will be submitted for approval by project supervisor. Is it intended that learners will in the main examine financial, economic, marketing, or other business data.

No End of Module Assessment

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: Full Time

Workload Type	*Workload Description*	*Hours*	*Frequency*	*Average Weekly Learner Workload*
Lecture	No Description	24	Every Week	24.00
Tutorial	No Description	24	Every Week	24.00
Independent Learning	No Description	202	Every Week	202.00
			Total Weekly Contact Hours	48.00

Workload: Part Time

Workload Type	*Workload Description*	*Hours*	*Frequency*	*Average Weekly Learner Workload*
Lecture	No Description	24	Every Week	24.00
Tutorial	No Description	24	Every Week	24.00
Independent Learning	No Description	202	Every Week	202.00
			Total Weekly Contact Hours	48.00

Module Resources

Recommended Book Resources

EMC Education Services. (2015), Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data, John Wiley & Sons, [ISBN: 111887613X].

Chisholm, A.. (2013), Exploring Data with RapidMiner, Packt Publishing, [ISBN: 1782169334].

John W. Foreman.. (2013), Data Smart: Using Data Science to Transform Information into Insight, Chichester; John Wiley and Sons, [ISBN: 111866146X].

Supplementary Book Resources

Provost, F. & Fawcett, T.. (2013), Data Science for Business, United States; O'Reilly Media, Incorporated, [ISBN: 1449361323].

Hofmann, M. & Klinkenberg, R.. (2013), RapidMiner: Data Mining Use Cases and Business Analytics Applications, Chapman & Hall/CRC Data Mining and Knowledge Discovery Series, [ISBN: 1482205491].

This module does not have any article/paper resources

This module does not have any other resources

Discussion Note:	