H6DV: Data Visualisation

Module Code:	H6DV
Long Title	Data Visualisation APPROVED
Title	Data Visualisation
Module Level:	LEVEL 6
EQF Level:	5
EHEA Level:	Short Cycle
Credits:	5
Module Coordinator:	Adriana Chis
Module Author:	Adriana Chis
Departments:	School of Computing
Specifications of the qualifications and experience required of staff	Master's degree and/or PhD degree in computing or cognate discipline. May have industry experience also

Learning Outcomes

On successful completion of this module the learner will be able to:

#	Learning Outcome Description
LO1	Analyse the theory and concepts relating to visualisation and data representation
LO2	Evaluate and distinguish between visualisation techniques for specific problems to enable effective communication of data analysis
LO3	Design, develop, and implement processes for data visualisation
LO4	Propose a suitable visualisation design for a particular combination of data characteristics and application

Dependencies

Module Recommendations

No recommendations listed

Co-requisite Modules

No Co-requisite modules listed

Entry requirements	Learners should have attained the knowledge, skills and competence gained from stage 1 of the BSc (Hons) in Data Science

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Module Content & Assessment

Indicative Content
Introduction • What is Data Visualisation? • Characteristics of Data, Data Types and Information, Ethical issues with sourcing datasets • Communication through visualisation
Visualisation Design • Data Visualisation Techniques • Principles and Workflow of data visualisation • Graphical integrity • Clarity of data representation • Elements of visual design (layout, colour, fonts, labelling, annotation, etc.)
Data Visualisations • Vector fields and flow data • Time-varying data • High-dimensional data: dimension reduction, parallel coordinates • Non-spatial data: multi-variate, tree/graph structured
Evaluation of Visualisation Methods • Small and large data sets • Suitable visualisation design • Data and application characteristics
Interactivity • Data adjustments • Presentation adjustments
Applications of Visualisation • Scientific, medical, mathematical data • Spatial Analysis

Assessment Breakdown	%
Coursework	100.00%

Assessments

Full Time

Coursework

Assessment Type:	Continuous Assessment	**% of total:**	Non-Marked
Assessment Date:	n/a	**Outcome addressed:**	2,4
Non-Marked:	Yes		

Assessment Description:
Ongoing independent and group design and development of visualisations using different types of data, visualisations techniques and tools. Feedback will be provided throughout these activities.

Assessment Type:	Continuous Assessment	**% of total:**	50
Assessment Date:	n/a	**Outcome addressed:**	1,2,3,4
Non-Marked:	No		

Assessment Description:
Learners are required to develop clear and effective visual representations of some of the features of a dataset(s). For example, learners will first create a number of visualizations, and then will create an infographic to highlight key information found in the dataset(s). The assignment includes a report to document the process for creating the visuals, to justify the techniques, layout, style, colours used.

Assessment Type:	Project	**% of total:**	50
Assessment Date:	n/a	**Outcome addressed:**	2,3,4
Non-Marked:	No		

Assessment Description:
Learning outcomes may be assessed through a project in which learners must choose and ethically acquire a set of raw data; design, develop, and document a process from preparing the data through to implementing interactive data visualisations or a number of static data visualisations; analyse the results; and provide an evaluation of the correct use of data and visual techniques that were implemented.

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.

Reassessment Description
The repeat strategy for this module is a terminal assessment. Students will be afforded an opportunity to repeat the assessment at a specified time during the academic year and all learning outcomes will be assessed in the repeat assessment.

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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	Classroom & Demonstrations (hours)	24	Per Semester	2.00
Practical	Other hours (Practical/Tutorial)	12	Per Semester	1.00
Independent Learning	Independent learning (hours)	89	Per Semester	7.42
			Total Weekly Contact Hours	3.00

Module Resources

Recommended Book Resources

Kirk, A. (2016). Data Visualisation. Sage Publishing..

Ward, M., Grinstein, G. & Keim, D. (2010). Interactive Data Visualization: Foundations, Techniques, and Applications. A. K Peters Ltd..

Ware, C. (2012). Information Visualization: Perception for Design. (3rd ed.). Morgan Kaufmann..

Barker, T. (2013). Pro Data Visualization using R and JavaScript. Apress..

Supplementary Book Resources

Tufte, E.R. (2001). The visual display of quantitative information, Graphics Press Cheshire. Conn..

Cairo, A. (2012). The Functional Art: An introduction to information graphics and visualization. New Riders..

Chang, W. (2013). R Graphics Cookbook. O'Reilly Media..

Murrell, P. (2011). R Graphics. (2nd ed.). CRC Press..

Janert, P.K. (2010). Data Analysis with Open Source Tools. O'Reilly Media..

Steele, J. & Iliinsky, N. (2011). Designing Data Visualizations. O'Reilly Media..

This module does not have any article/paper resources

This module does not have any other resources

Discussion Note:	