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MODULE DESCRIPTOR

Module Title

Data Science Development

Reference	CMM535	Version	4
Created	April 2017	SCQF Level	SCQF 11
Approved	April 2015	SCQF Points	15
Amended	August 2017	ECTS Points	7.5

Aims of Module

To provide students with necessary skills for developing complete data science products using state-of-the-art techniques.

Learning Outcomes for Module

On completion of this module, students are expected to be able to:

- 1 Discuss the main concepts and tools for a data science project.
- 2 Load, explore, model and visualise data using off-the-shelf tools and packages.
- 3 Report data science results to a wider audience by tailoring them at different levels of detail.
- 4 Design, implement and evaluate a data science product that addresses a given data problem taking in account relevant professional, legal, ethical, security and social issues.

Indicative Module Content

1. Data science programming concepts 2. Data preparation methods 3. Data exploration, summarisation, transformation and visualisation techniques 4. Descriptive analytics (Cluster analysis) 5. Predictive analytics (Classification and regression analysis) 6. Advanced analytics (Deep Learning) 7. Real world data problems.

Module Delivery

This is a lecture based module, supplemented with practical sessions, where a data science programming language will be used to teach students how to develop a complete data science project from data preparation to advanced analytics. Online materials and online sessions will be used to support DL students.

Indicative Student Workload

	Full Time	Part Time
Contact Hours	33	33
Non-Contact Hours	117	117
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	150
<i>Actual Placement hours for professional, statutory or regulatory body</i>		

ASSESSMENT PLAN

If a major/minor model is used and box is ticked, % weightings below are indicative only.

Component 1

Type: Coursework Weighting: 100% Outcomes Assessed: 1, 2, 3, 4
 Description: Research paper and presentation

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

The student has to achieve Grade D in C1 to pass the module.

Module Grade	Minimum Requirements to achieve Module Grade:
A	The student needs to achieve an A in C1.
B	The student needs to achieve B in C1.
C	The student needs to achieve C in C1.
D	The student needs to achieve D in C1.
E	The student needs to achieve E in C1.
F	The student needs to achieve F in C1.
NS	Non-submission of work by published deadline or non-attendance for examination

Module Requirements

Prerequisites for Module	None.
Corequisites for module	None.
Precluded Modules	None.

INDICATIVE BIBLIOGRAPHY

- 1 JAMES, G., WITTEN, D., HASTIE, T., & TIBSHIRANI, R. (2021) An introduction to statistical learning with applications in R. New York: springer.
- 2 An Introduction to R, Version 4.1.2 (2021), <https://cran.r-project.org/doc/manuals/R-intro.pdf>
- 3 ZHAO, Y. (2012-2015). R and Data Mining: Examples and Case Studies, Elsevier. <http://www2.rdatamining.com/uploads/5/7/1/1/3/57136767/rdatamining-book.pdf>
- 4 KORDON, K. (2020) Applying Data Science: How to Create Value with Artificial Intelligence. Springer.
- 5 MAILUND, T. (2017) Beginning Data Science in R Data Analysis, Visualization, and Modelling for the Data Scientist. APress.