

## MODULE DESCRIPTOR

### Module Title

Data Mining

|           |               |             |        |
|-----------|---------------|-------------|--------|
| Reference | CM2137        | Version     | 1      |
| Created   | December 2023 | SCQF Level  | SCQF 8 |
| Approved  | June 2019     | SCQF Points | 15     |
| Amended   | June 2023     | ECTS Points | 7.5    |

### Aims of Module

To provide students with an understanding of the main principles underlying Data Mining techniques and the ability to apply current Data Mining tools to datasets.

### Learning Outcomes for Module

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

- 1 Compare the advantages and disadvantages of applying a specific data mining technique to a given learning task.
- 2 Use appropriate data mining techniques to solve a given problem.
- 3 Show the results of data mining through the selection of appropriate evaluation techniques.
- 4 Report current strengths, limitations and ethical issues in the use of data mining technology.

### Indicative Module Content

Data mining concepts. Data mining methodology and life cycle (e.g., CRISP-DM). Data mining types (e.g., supervised and unsupervised). Data mining tasks (e.g., classification, clustering, regression). Data mining algorithms (e.g., Decision tree, random forest, SVM, KNN). Data mining applications. Ethical issues and potential bias in data mining.

### Module Delivery

This module is based on lectures supplemented with laboratory sessions, where industry standard data mining software is applied to varied learning tasks and practical exercises.

### Indicative Student Workload

|  | Full Time | Part Time |
|--|-----------|-----------|
| Contact Hours  | 30        | N/A       |
| Non-Contact Hours  | 120       | N/A       |
| Placement/Work-Based Learning Experience [Notional] Hours                    | N/A       | N/A       |
| TOTAL  | 150       | N/A       |
| <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: Practical Exam      Weighting: 100%      Outcomes Assessed: 1, 2, 3, 4  
 Description: Practical examination applying data mining techniques to a given dataset.

**MODULE PERFORMANCE DESCRIPTOR****Explanatory Text**

The calculation of the overall grade for this module is based on 100% weighting of component 1. An overall minimum grade D is required to pass the module.

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

**Module Requirements**

|                          |   |
|--------------------------|---|
| Prerequisites for Module | None except for course entry requirements |
| Corequisites for module  | None.                                     |
| Precluded Modules        | None.                                     |

**INDICATIVE BIBLIOGRAPHY**

- 1 WITTEN, I.H. et al., 2017. Data mining: practical machine learning tools and techniques. 4th ed. Amsterdam, Netherlands: Morgan Kaufmann.
- 2 NETTLETON, D., 2014. Commercial data mining: processing, analysis and modeling for predictive analytics projects. Amsterdam, Netherlands: Morgan Kaufmann.
- 3 MOHAMMED, J.Z. and WAGNER, M., 2014. Data mining and analysis: fundamental concepts and algorithms. Cambridge: Cambridge University Press.
- 4 ZAO, Y., 2013. R and data mining. Examples and case studies. Amsterdam, Netherlands: Academic Press.
- 5 PORCU, V., 2018. Python for data mining quick syntax reference. New York, NY: Apress.