

MODULE DESCRIPTOR

Module Title

Data Visualisation and Analysis

| | | | |
|-----------|--------------|-------------|---------|
| Reference | CMM020 | Version | 6 |
| Created | April 2023 | SCQF Level | SCQF 11 |
| Approved | January 2013 | SCQF Points | 15 |
| Amended | August 2023 | ECTS Points | 7.5 |

Aims of Module

To introduce the principles and techniques involved in the displaying of data to provide greater insight into the information contained within the data.

Learning Outcomes for Module

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

- 1 Critically appraise different data visualisation methods for a variety of data types.
- 2 Produce fitted models for data.
- 3 Critically evaluate the output of data visualisation and analysis tasks.
- 4 Produce solutions for the effective display and analysis of data.

Indicative Module Content

Visualisations: reasons for data visualisation; visualisation requirements; cognitive processes in visualisation; lie factor; data-ink ratio; data variation vs. design variation; mapping data to visual representations; basic charts and their uses; display of quantitative data including univariate, bivariate, trivariate, multidimensional, tree and network data; data visualisation design; data and task abstractions; visual encodings; marks and channels.
 Analysis: general considerations in data analysis; descriptive statistics; univariate distributions; bivariate data and linear regression; time series; smoothing including moving average and exponential; seasonal effects; additive, multiplicative and mixed models; professional use of data; ethical and legal issues within data analysis.

Module Delivery

The module is taught using a structured programme of lectures, tutorials, practical exercises and student-centred learning.

Indicative Student Workload

| | Full Time | Part Time |
|--|-----------|-----------|
| Contact Hours | 30 | 30 |
| Non-Contact Hours | 120 | 120 |
| 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: | Practical Exam | Weighting: | 100% | Outcomes Assessed: | 1, 2, 3, 4 |
| Description: | Practical examination where the student applies analysis and visualisation techniques to a given dataset and evaluates the results obtained. | | | | |

MODULE PERFORMANCE DESCRIPTOR**Explanatory Text**

To achieve a pass in this module requires a minimum of Grade D in Component 1.

| Module Grade | Minimum Requirements to achieve Module Grade: |
|--------------|--|
| A | A in Component 1 |
| B | B in Component 1 |
| C | C in Component 1 |
| D | D in Component 1 |
| E | E in Component 1 |
| F | F in Component 1 |
| NS | Non-submission of work by published deadline or non-attendance for examination |

Module Requirements

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

INDICATIVE BIBLIOGRAPHY

- 1 WARE, C., 2019. Information Visualization: Perception for Design. 4th ed. Morgan Kaufmann.
- 2 KIRK, A., 2019. Data Visualisation, A Handbook for Data Driven Design. 2nd ed. Sage Publishing
- 3 TUFTE, E., 2001. The Visual Display of Quantitative Information. Graphics Press.
- 4 MUNZER, T. 2014 Visualisation Analysis and Design. CRC Press.
- 5 DIEZ, D.M., BARR, C.D., CETINKAYA-RUNDEL, M., 2015. [online] OpenIntro Statistics. 3rd ed. OpenIntro. Available from: <https://www.openintro.org/stat/textbook.php> [Accessed 25th March 2016]
- 6 COWPERTWAIT, P.S.P., METCALFE, A.V., 2009. Introductory Time Series with R. Springer.