MODULE DESCRIPTOR

Module Title

Data Analysis

Reference	CM1123	Version	1
Created	December 2023	SCQF Level	SCQF 7
Approved	April 2024	SCQF Points	15
Amended		ECTS Points	7.5

Aims of Module

This module aims to provide students with the foundational skills needed to summarise and analyse numeric data, focusing on practical application of this knowledge in a modern computing environment.

Learning Outcomes for Module

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

1	Employ appropriate statistics to measure the average and spread of a data set.
2	Present data visually using appropriate types of graph.
3	Recall basic probability laws for independent and interdependent variables.
4	Obtain estimates of population parameters from data samples.
5	Apply statistical tests to draw conclusions about data.

Indicative Module Content

Mean, median. mode, standard deviation, interquartile range, outlier detection. Tables, scatter plots, box plot, sina plot, violin plot, error bars, linear regression. Probability notation, independence, conditional probability, uniform distribution, binomial distribution, normal distribution. Sampling techniques, bias, central limit theorem, confidence intervals. Hypothesis testing, type 1 and type 2 errors, z-test, t-test, p values, Wilcoxon test, Mann-Whitney test, chi-squared test.

Module Delivery

This module is delivered using a mixture of lectures, tutorials and laboratory sessions as appropriate.

Module Ref:	CM1123 v1

Indicative Student Workload	Full Time	Part Time
Contact Hours	40	N/A
Non-Contact Hours	110	N/A
Placement/Work-Based Learning Experience [Notional] Hours	N/A	N/A
TOTAL	150	N/A
Actual Placement hours for professional, statutory or regulatory body		

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, 5
Description:	An individual computer-based assessment involving summarising, visualising and analysing a given dataset.				

MODULE PERFORMANCE DESCRIPTOR

Explanatory Text

The calculation of the overall grade for this module is based on 100% weighing of C1.

Module Grade	Minimum Requirements to achieve Module Grade:
A	The student needs to achieve an A in C1
B	The student needs to achieve a B in C1
C	The student needs to achieve a C in C1
D	The student needs to achieve a D in C1
E	The student needs to achieve an E in C1
F	The student needs to achieve an 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	Introduction to Statistics and Data Analysis: With Exercises, Solutions and Applications in R Heumann, Christian ; Schomaker, Michael ; Shalabh 2023
2	Statistics for Data Scientists: An Introduction to Probability, Statistics, and Data Analysis Kaptein, Maurits ; van den Heuvel, Edwin 2022
3	Introduction to probability and statistics for engineers and scientists Ross, Sheldon M. 2021
4	Introduction to Statistics Through Resampling Methods and R: Good/Introduction to Statistics Through Resampling Methods and R Phillip I. Good 2013
5	Introduction to Statistics: Fundamental Concepts and Procedures of Data Analysis Reid, Howard M 2013