

Module specification

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Module Code	COM762
Module Title	Advanced Data Analysis and Visualisation
Level	7
Credit value	20
Faculty	FACE
HECoS Code	100956
Cost Code	GACP

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
MSc Data Science and Big Data Analytics	Core
MSc Data Science and Big Data Analytics with Advanced Practice	Core

Pre-requisites

N/A

Breakdown of module hours

Learning and teaching hours	11 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	10 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	21 hrs
Placement / work based learning	0 hrs
Guided independent study	179 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	08/11/2023
With effect from date	Sept 2024



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Date and details of revision	
Version number	1

Module aims

This module aims to explore the advanced concepts of collecting, analysing and visualising data and to create data analysts who can identify patterns and display information from data of several sources. Student will explore various statistical methods and algorithms for data analysis. Students will be able to discover, analyse, visualise, and present data in a meaningful way that will harness the power of data for new insights as well as evaluate the legal, social and ethical impact of data analysis and its applications. Students will gain practical skills using commercially available industry standard software to apply data analysis and visualisation techniques to real world data analytical problems.

Module Learning Outcomes - at the end of this module, students will be able to:

1	Summarise the various statistical techniques and algorithms.
2	Critically evaluate several common data domains and corresponding analysis tasks, including exploratory data analysis.
3	Synthesise and apply advanced analytical theories and methods.
4	Create visualisation outputs and map spatial data using contemporary tools and techniques.
5	Critically evaluate and apply appropriate analytic tools and techniques to analyse big data and present the knowledge.

Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Students will submit a series of brief portfolio pieces throughout the semester. For the final part of the assessment students will have the chance to showcase their proficiency in critically analysing their work and generating visually captivating spatial data outputs that effectively convey their findings. Through these assessments, students will be able to apply their practical skills in data analysis and visualization, thereby gaining valuable hands-on experience.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1,2,3,4,5	Portfolio	100%

Derogations

None



Learning and Teaching Strategies

Aligned with the principles of the Active Learning Framework (ALF), the module will incorporate a blended digital approach utilising a Virtual Learning Environment (VLE). These resources may include a range of content such as first and third-party tutorials, instructional videos, supplementary files, online activities, and other relevant materials to enhance their learning experience. The use of a range digital tool via the virtual learning environment together with additional sources of reading will also be utilised to accommodate learning preferences.

Indicative Syllabus Outline

- Statistical methods and algorithms
- Advanced Data Analytics
- Data Analytics Techniques and Applications
- Data Visualisation Tools and Techniques
- Spatial and Geographical Data Analysis and Visualisation
- Sentiment Analysis

Indicative Bibliography:

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads

J. Morrow, *Be Data Analytical: How to Use Analytics to Turn Data into Value*. Kogan Page. 2023.

Other indicative reading

L. Comber, *Geographical Data Science and Spatial Data Analysis: An Introduction in R (Spatial Analytics and GIS)*. Kindle. 2020.

J.P. Isson, *Unstructured Data Analytics - How to Improve Customer Acquisition, Customer Retention, and Fraud Detection and Prevention*. CENGAGE Learning. 2018.

S. Sedkaoui, *Data Analytics and Big Data*. Wiley. 2018.

Journals (available electronically through the library. ACM Digital Library. IEEE Xplore)