

## Module specification

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Module Code	CONL703
Module Title	Data Analysis and Visualisation
Level	7
Credit value	15
Faculty	FACE
HECoS Code	100755
Cost Code	GACP

## Programmes in which module to be offered

Programme title	Is the module core or option for this programme
MSc Computer Science with Artificial Intelligence	Core
MSc Computer Science with Big Data Analytics	Core

## Pre-requisites

None

## Breakdown of module hours

Learning and teaching hours	15 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
<b>Total active learning and teaching hours</b>	<b>15 hrs</b>
Placement / work based learning	0 hrs
Guided independent study	135 hrs
<b>Module duration (total hours)</b>	<b>150 hrs</b>

<b>For office use only</b>	
Initial approval date	04/09/2019
With effect from date	01/01/2020
Date and details of revision	27/06/2024 Programme revalidation
Version number	2

## Module aims

This module aims to equip students with a comprehensive understanding of fundamental concepts in data analysis and visualisation with an exploration of big data. The primary focus will be on utilising Tableau as a powerful visualisation tool while also introducing students to Python for data processing and analysis. Through hands-on practice and theoretical learning, students will develop the skills necessary to analyse and visualise data effectively. Additionally, the module will delve into the complexities of big data, providing insights into its management, processing, and the challenges associated with its analysis. By the end of this module, students will have a strong understanding of using Tableau for visual representation and gain introductory knowledge of Python's capabilities in handling and analysing data, enabling them to create meaningful insights from diverse datasets.

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

1	Demonstrate a systematic understanding of the Data Analytics Life Cycle, applying critical awareness and in-depth knowledge to analyse and interpret its stages.
2	Employ and integrate advanced analytical theories and methods systematically and creatively.
3	Acquire and demonstrate practical skills in utilizing modern data analytical tools and techniques.
4	Critically evaluate and adeptly apply appropriate analytic tools and techniques to analyse a variety of datasets.

## Assessment

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.

### Indicative Assessment Tasks:

The assessments will be in the form of a report on the development and application of data analysis and visualisation in the twenty first century and an Applied Tableau and Python portfolio - Visualisation and data analysis of a given data set This task will provide an opportunity for the students to transfer the theoretical knowledge into practical applications.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1, 2, 3	Coursework	30
2	1, 2, 3, 4	Coursework	70

## Derogations

None

## Learning and Teaching Strategies

The overall learning and teaching strategy is one of guided independent study requiring ongoing student engagement. Online material will provide the foundation of the learning resources, requiring the students to log in and engage regularly throughout the eight weeks

of the module. There will be a mix of suggested readings, discussions and interactive content containing embedded digital media and self-checks for students to complete as they work through the material and undertake the assessment tasks. A range of digital tools via the virtual learning environment and additional sources of reading will also be utilised to accommodate learning styles. There is access to a helpline for additional support and chat facilities through Canvas for messaging and responding.

## Indicative Syllabus Outline

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- Introduction: Fundamentals of data analysis and visualisation / Introduction to Tableau
- Big Data and Analysis Life Cycle
- Understanding Your Data
- Analysis and Decision Making
- Uncertainty Visualisation and Visualisation Design
- Python Data Analysis
- Python Visualisations and The Future of Data

## Indicative Bibliography:

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

### Essential Reads

C. O. Wilke, *Fundamentals of Data Visualization*. Sebastopol, CA: O'Reilly Media, 2019.

### Other indicative reading

EMC, *Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data*. Hoboken, NJ: Wiley, 2015.

S. Sedkaoui, *Data Analytics and Big Data*. London: ISTE Ltd/John Wiley and Sons Inc., 2018.

N. Ceder, *The Quick Python Book*. 3<sup>rd</sup> ed. Shelter Island, NY: Manning Publications Co., 2018.