

Module Code:	CONL703
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Module Title:	Data Analysis and Visualisation
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Level:	7	Credit Value:	15
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Cost Centre(s):	GACP	<u>JACS3</u> code:	I260
		<u>HECoS</u> code:	100755

Faculty	FAST	Module Leader:	Bindu Jose
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Scheduled learning and teaching hours	15 hrs
Guided independent study	135 hrs
Placement	0 hrs
Module duration (total hours)	150 hrs

Programme(s) in which to be offered (not including exit awards)	Core	Option
MSc Computer Science with Big Data Analytics	✓	<input type="checkbox"/>

Pre-requisites
Studied CONL701 Critical Research for Postgraduate Study

Office use only

Initial approval: 04/09/2019

Version no:2

With effect from: 01/01/2020

Date and details of revision: Reading list amended with effect from: 08/03/2021

Module Aims

This module aims to explore the fundamental concepts of collecting, analysing and visualising data and to create data analysts who can identify patterns and display information from data of several sources. 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. Students will gain practical skills using a commercially available open source software (for example R Studio, HADOOP etc.) to apply data analysis and visualisation techniques to real world data analytical problems.

Intended Learning Outcomes

Key skills for employability

- KS1 Written, oral and media communication skills
- KS2 Leadership, team working and networking skills
- KS3 Opportunity, creativity and problem solving skills
- KS4 Information technology skills and digital literacy
- KS5 Information management skills
- KS6 Research skills
- KS7 Intercultural and sustainability skills
- KS8 Career management skills
- KS9 Learning to learn (managing personal and professional development, self-management)
- KS10 Numeracy

At the end of this module, students will be able to

Key Skills

1. Analyse and interpret the Data Analytics Life Cycle.	KS1 KS3 KS4 KS5 KS6 KS9
2. Synthesise and apply advanced analytical theories and methods	KS1 KS2 KS3 KS4 KS5 KS9
3. Gain practical skills for using modern data analytical tools and techniques	KS1 KS3 KS4 KS5 KS6 KS10
4. Critically evaluate and apply appropriate analytic tools and techniques to analyse big data and present the knowledge	KS1 KS3 KS5 KS6 KS8 KS9

Transferable skills and other attributes

Analysis and design skills
 Critical thinking and evaluation
 Organisation and time management

Derogations

None

Assessment:

Indicative Assessment Tasks:

The assessment will be in the form a portfolio of weekly tasks incorporating both theoretical and practical exercises. The tasks will provide an opportunity for the students to transfer the theoretical knowledge into practical applications. These will involve weekly exercises focused on design and development activities, along with restricted response quizzes.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration or Word count (or equivalent if appropriate)
1	1,2,3,4	Portfolio	100%	3,000 (equiv)

Learning and Teaching Strategies:

The overall learning and teaching strategy are one of guided independent study requiring ongoing student engagement. Online material will provide the foundation of the learning resources, requiring the students to login and engage on a regular basis throughout the eight-week period 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. The use of a range digital tools via the virtual learning environment together with 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.

Syllabus outline:
<ol style="list-style-type: none"> 1. Overview of Data Analytics 2. Real time analytics 3. Data Analytics Lifecycle (Discovery, Preparation, Planning, ..., ...) 4. Analytical Theory and Methods (for e.g.: Clustering, Association rules, Regression, etc.) 5. Data Analysis and Visualisation Tools and Technologies (for e.g.: HADOOP, Database-Analytics, R etc.)
Indicative Bibliography:
Essential reading
EMC. (2015), <i>Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data</i> . Wiley
Other indicative reading
Ceder, N (2018) <i>The Quick Python Book</i> . Third Edition, Manning Publications Co, Shelter Island
Sedkaoui, S. (2018), <i>Data Analytics and Big Data</i> . Wiley