UNIVERSITY of BRADFORD

Module Descriptor

Module Details	
Module Title	Data Science for Applied AI
Module Code	GAV5026-B
Academic Year	2022/3
Credits	20
School	Department of Media Design and Technology
FHEQ Level	FHEQ Level 5

Contact Hours	
Type	Hours
Laboratories	20
Lectures	8
Seminars	20
Directed Study	152

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 1

Module Aims

Provide the necessary underpinning of technical and computer skills and knowledge to support the delivery of AI-driven data analytical solutions to real-life problems.

Explain current concepts, principles, and techniques for conducting descriptive and predictive analytics.

Demonstrate various data science techniques with hands-on examples and in-depth case studies.

Outline Syllabus

- Introduction to mathematical and statistical concepts related to data science.
- Introduction to various data collection and pre-processing approaches as: planning of data gathering, reading and writing data on the file system, retrieving data from the web, cleaning and restructuring data.
- Introduction to descriptive and predictive modelling by exploring various related topics such as Principal Component Analysis, clustering algorithms, logistic regression, neural networks and K-Nearest neighbour.
- Hands-on experience of data analytics using current tools such as R, Python libraries NumPy, pandas, matplotlib, IPython, SciPy (incorporating any newly released tools and technologies relevant to data analytics).

Learning Outcomes	
Outcome Number	Description
LO1	Analyse current principles and concepts underpinning data science.
LO2	Deploy descriptive and predictive analytics to effectively interpret data.
LO3	Demonstrate the use of a range of AI libraries to pre-process, analyse and visualize data.
LO4	Demonstrate the use of predictive analytics tools to analyse common business scenarios.

Learning, Teaching and Assessment Strategy

Delivery of the module will consist of lectures, lab sessions, and seminars, supplemented by directed study. Along with discussing the capabilities of AI-driven data analytics techniques, the potential applications of these techniques in the real-world will also be explored.

Lab sessions and seminars will engage students in activities such as case-studies and problem-solving exercises.

In independent study, all students will be required to learn and practise how to use appropriate data analytics tools with direction/support from tutors, demonstrators and peers.

The summative assessment for this module takes the form of a single report in which students will:

- Examine different analytical methods and tools
- Design an appropriate framework to solve a given AI case study/problem
- Evaluate their implementation of an AI-based analytical method on a sourced open-access dataset

Students will complete formative tasks throughout this module, both individually and in groups, which mirror the tasks expected for the elements of the summative assessment. Feedback will be provided via seminar and laboratory sessions. Supplementary assessment is as original.

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Coursework - Written	Report (3000 words) on a given case study/problem	100%
Formative	Coursework - Written	Completion of formative tasks: analysing problems/case studies, collecting and processing datasets, descriptive and predictive modelling.	N/A

Reading List

To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html

Please note:
This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.

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