

Module Details	
Module Title	Applied Machine Learning and Big Data Strategy
Module Code	OIM7508-B
Academic Year	2021/2
Credits	20
School	School of Management
FHEQ Level	FHEQ Level 7

Contact Hours	
Type	Hours
Lectures	20
Online Lecture (Synchronous)	4
Laboratories	12
Online Tutorials (Synchronous)	4
Online Tutorials (Synchronous)	2
Directed Study	158

Availability	
Occurrence	Location / Period
BDA	University of Bradford / Semester 2

Module Aims
<p>This module aims to provide students with knowledge of applied machine learning techniques and big data technology, analytics, and associated business strategies to design solutions for a range of applied fields. More specifically, students will explore the state of the art and application of machine learning tools and big data strategies and how these can provide real-time support to relevant stakeholders in fields such as healthcare, marketing, and government/public sector.</p> <p>The module offers a hands-on approach to machine learning and big data and it focuses on developing both coding analytics skills (using Python) and coding-free analytics skills (using platforms such as Microsoft Azure, AWS Machine Learning, Amazon SageMaker, KNIME, and other Amazon Big Data services).</p>

Outline Syllabus

Indicative content:

- * Evaluation of machine learning systems;
- * Machine Learning with Python - Unsupervised, semi-supervised, supervised learning techniques;
- * Deep Learning and TensorFlow;
- * Reinforcement learning technique;
- * The use cases, implementation, and limitations of machine learning algorithms and systems;
- * Big Data Ecosystem and relevant technologies;
- * Cloud Computing - Microsoft Azure, AWS Machine Learning, Amazon SageMaker, Amazon DynamoDB, Amazon Kinesis, Amazon EMR, AWS Deep Learning AMLs, and KNIME.

Learning Outcomes

Outcome Number	Description
01	Demonstrate a critical awareness of the type of problems that can be addressed by Machine Learning and Big Data Strategies.
02	Demonstrate a comprehensive understanding of the application of selected techniques in Machine Learning and critically assess their use and limitations in view of Big Data.
03	Demonstrate originality in the application of knowledge, together with a practical understanding of how established tools in Machine Learning are applied to a range of fields in view of Big Data; and interpret and explain the results and their implications for practice.
04	Demonstrate the qualities and transferable skills of independent learning ability required for continuing professional development.

Learning, Teaching and Assessment Strategy

Learning will be directed, supported, and reinforced through a combination of online lectures (synchronous and/or asynchronous), tutorials (online and face-to-face), online lab sessions, and discussion groups, as well as through directed and self-directed study.

Formal lectures will focus on the theoretical knowledge and principles of machine learning algorithms and techniques, the big data ecosystem, and the applications of machine learning and big data, along with their limitations.

Tutorials will engage students in active learning sessions which draw on and build upon the knowledge base acquired during the lectures to further deepen understanding.

Lab sessions will complement formal lectures and tutorials and will be an opportunity for students to do some hands-on-system work, and focus on developing and practising both coding analytics skills (using Python) and coding-free analytics skills (using platforms such as Microsoft Azure, AWS Machine Learning, Amazon SageMaker, KNIME, and other Amazon Big Data services). These activities may be based on case studies or problem-solving exercises.

Formative feedback will be provided during tutorials. Furthermore, formative feedback will be provided on the coding/model building reports that students will be developing during the lab sessions.

Students will be assessed based on an individual report of 3000 words. This assessment requires students to select a relevant tool and/or technique and design and develop an ML application using an open-access dataset, with application in the real-world.

Students are expected to demonstrate good effort in exploring the background of the practical problem identified, understanding the dataset, processing the data, developing a meaningful ML application, writing up the report, along with reflecting on how such exercise informs the big data strategy of the organisation. This assessment will assess against all the learning outcomes specified in this document (LO1, LO2, LO3, and LO4) and will be an excellent opportunity to practice relevant skills required for the delivery of the final capstone dissertation.

Mode of Assessment

Type	Method	Description	Weighting
Summative	Coursework - Written	Individual report (3000 words)	100%

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.