

Module Details	
Module Title	Machine Learning
Module Code	COS6026-B
Academic Year	2024/5
Credits	20
School	School of Computer Science, AI and Electronics
FHEQ Level	FHEQ Level 6

Contact Hours	
Type	Hours
Lectures	24
Laboratories	22
Directed Study	154

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

Module Aims
To provide knowledge and experience of the creation of machine learning systems for a variety of real-life applications, using supervised or unsupervised learning techniques.

Outline Syllabus
Machine learning principles and applications, fuzzy logic and machine learning, Decision trees, Bayesian networks, instance-based learning, clustering, reinforcement learning, artificial neural networks, deep learning, support vector machines and Dimensionality reduction techniques, methods for evaluating performance of machine learning systems. Legal, Ethical, Social, Professional issues will be discussed within the machine learning principles.

Learning Outcomes	
Outcome Number	Description
01	Critically review a range of machine learning approaches, their evaluation and model selection
02	Demonstrate critical understanding of machine learning applications and data processing
03	Demonstrate critical understanding of the analysis, design and implementation of machine learning systems
04	Demonstrate critical understanding of the analysis, design and implementation of machine learning systems

Learning, Teaching and Assessment Strategy
<p>The course will consist of lectures, computer lab sessions, independent study, and directed reading to provide the opportunity to gain theoretical knowledge and practical knowledge of Machine Learning. Formal lectures will outline the theoretical principles of Machine Learning. Lab sessions will provide students with the necessary software skills to develop their own Machine Learning systems. The coursework will involve students in the practical development of Machine Learning models on real-life data sets and problems. Students will be assessed through two courseworks.</p> <p>Utilising recent developments and current research in Machine Learning, the students will participate in lectures, labs and independent study to explore advanced concepts and solve real-world problems. This module will use recent developments, case studies, practical demonstrations, and significant opportunities for students to design their own solutions.</p> <p>To support accessibility, clarity and comprehension all teaching material is provided online wherever possible in advance of the teaching sessions. Throughout the programme, lots of opportunities are provided for students to design their own solutions and to express their own ideas, choosing from a variety of Machine Learning frameworks, tools, and services.</p> <p>To prepare the students for employment in the real-world, assessments are designed to measure industry needed skills such as data processing, multidisciplinary skills, software development, evaluation of machine learning models and systems, report writing skills and team-work skills (using group-based coursework to strengthened students? ability to work effectively in teams). Throughout the module, students will be provided with variety of practical problems, which will help develop confidence in tackling data analysis problems and in the use of the software tools that will support them. The timely constructive feedback during practical lab exercises and online support using TEL tools will support student learning throughout the module.</p> <p>Assessment is in the form of two coursework exercise that require students to select and solve problems in the fields of Machine Learning using both the knowledge gained in the module as well as independent research conducted during the completion of the coursework. Communication of research outcomes and key findings are tested in written report and software codes.</p>

Mode of Assessment			
Type	Method	Description	Weighting
Summative	Coursework - Written	Exercises on the development and creation of machine learning systems with code production	50%
Summative	Coursework - Written	Exercises on the development of machine learning based solution to a real-life problem with code production.	50%

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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