Module Descriptor

Title	Machine Learning for Data Analytics		
Session	2025/26	**Status**	Published
Code	COMP10082	**SCQF Level**	10
Credit Points	20	**ECTS (European Credit Transfer Scheme)**	10
School	**Computing, Engineering and Physical Sciences**		
Module Co-ordinator	Graham Parsonage		

Summary of Module

This module introduces the student to the fundamental concepts of both Machine Learning and Data Analytics in order to provide students new methods and procedures to develop new insights into the vast array of data now available in todays business critical infrastructures.

The module is complemented with labs where the concepts explained in lectures can be put in practices in order to get deeper understanding on the fundamentals of how machine learning can be used to analyse trends and anomalies within various data samples.

Additionally, this module will work to develop a number of the key 'I am UWS' Graduate Attributes to make those who complete this module:

Universal

Critical Thinker Ethically-minded Research-minded

Work Ready Problem-Solver

Effective Communicator

Ambitious

Successful

Autonomous Resilient Driven

The scope of the module includes the following topics: Machine Learning Theory and Algorithms

Decision Trees

Supervised and Unsupervised Machine Learning Reinforced Learning

Performance Analysis Anomaly Detection

Data Mining and Analytics

Module Delivery Method	On-Campus[1] ☐	Hybrid[2] ☒	Online[3] ☐	Work -Based Learning[4] ☐
Campuses for Module Delivery	☐ Ayr ☐ Dumfries	☒ Lanarkshire ☐ London ☐ Paisley	☐ Online / Distance Learning ☐ Other (specify)	

Terms for Module Delivery	Term 1	☒	Term 2	☐	Term 3	☐
Long-thin Delivery over more than one Term	Term 1 – Term 2	☐	Term 2 – Term 3	☐	Term 3 – Term 1	☐

Learning Outcomes	
L1	Demonstrate a critical understanding of a range of machine learning approaches
L2	Demonstrate detailed knowledge of the use of machne learning systems for data processing and analytics.
L3	Design and evaluate the performances of various machine learning methods for data analytic
L4	Demonstrate the use of variuos problem solving techniques when preparing a variety of data sets for analysis
L5	N/A

Employability Skills and Personal Development Planning (PDP) Skills	
SCQF Headings	**During completion of this module, there will be an opportunity to achieve core skills in:**
Knowledge and Understanding (K and U)	**SCQF 10** The aim of the module is to enable the student to acquire the knowledge and understanding of Machine Learning through lectures, group practicals and guided self-study.
Practice: Applied Knowledge and Understanding	**SCQF 10** Knowledge gained will be demonstrated through successful completion of coursework, laboratories and research.
Generic Cognitive skills	**SCQF 10**

[1] Where contact hours are synchronous/ live and take place fully on campus. Campus-based learning is focused on providing an interactive learning experience supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus contact hours will be clearly articulated to students.

[2] The module includes a combination of synchronous/ live on-campus and online learning events. These will be supported by a range of digitally-enabled asynchronous learning opportunities including learning materials, resources, and opportunities provided via the virtual learning environment. On-campus and online contact hours will be clearly articulated to students.

[3] Where all learning is solely delivered by web-based or internet-based technologies and the participants can engage in all learning activities through these means. All required contact hours will be clearly articulated to students.

[4] Learning activities where the main location for the learning experience is in the workplace. All required contact hours, whether online or on campus, will be clearly articulated to students

	Through the development of systems to analyse datasets as the student works through the lab work they will be able to apply these methodologies to other aspect of their work.
Communication, ICT and Numeracy Skills	**SCQF 10** Throughout the lab program students will have to work together in the development and implementation of machine learning algorithms. Students will then have to write their own evaluation of the lab work so will have to use word processing, capturing and formatting of images and other computing skills.
Autonomy, Accountability and Working with Others	**SCQF 10** Various deadlines are imposed for the handing in of course work which requires the student to manage their time. The lab work has a small component of group working so the student will learn how to work within a group yet also fulfill their own personal work schedule.

Prerequisites	**Module Code**	**Module Title**
	Other	
Co-requisites	**Module Code**	**Module Title**

Learning and Teaching	
In line with current learning and teaching principles, a 20-credit module includes 200 learning hours, normally including a minimum of 36 contact hours and maximum of 48 contact hours.	
Learning Activities During completion of this module, the learning activities undertaken to achieve the module learning outcomes are stated below:	**Student Learning Hours** (Note: Learning hours include both contact hours and hours spent on other learning activities)
Lecture / Core Content Delivery	12
Laboratory / Practical Demonstration / Workshop	36
Independent Study	52
Practice-based Learning	100
Please select	
Please select	
TOTAL	200

Indicative Resources
The following materials form essential underpinning for the module content and ultimately for the learning outcomes: The following materials form essential underpinning for the module content and ultimately for the learning outcomes: SHOW ME THE NUMBERS: Designing Tables and Graphs to Enlighten by Stephen Few. Analytics Press; 2nd ed. edition

Storytelling with Data: A Data Visualization Guide for Business Professionals by Cole Nussbaumer Knaflic. John Wiley & Sons

Machine Learning For Absolute Beginners: A Plain English Introduction by Oliver Theobald. Mastering Machine Learning Algorithms by Giuseppe Bonaccorso. Packt Publishing; 2nd edition

Data Science with Python: Combine Python with machine learning principles to discover hidden patterns in raw data by by Rohan Chopra, Aaron England, Mohamed Noordeen Alaudeen. Packt Publishing

(N.B. Although reading lists should include current publications, students are advised (particularly for material marked with an asterisk*) to wait until the start of session for confirmation of the most up-to-date material)

Attendance and Engagement Requirements

In line with the Student Attendance and Engagement Procedure, Students are academically engaged if they are regularly attending and participating in timetabled on-campus and online teaching sessions, asynchronous online learning activities, course-related learning resources, and complete assessments and submit these on time.

For the purposes of this module, academic engagement equates to the following:

The School of Computing, Engineering and Physical Sciences considers attendance and engagement to mean a commitment to attending, and engaging in, timetabled sessions. You will scan your attendance via the scanners each time you are on-campus and you will login to the VLE several times per week. Where you are unable to attend a timetabled learning session due to illness or other circumstance, you should notify the Programme Leader that you cannot attend. Across the School an 80% attendance threshold is set. If you fall below this, you will be referred to the Student Success Team to see how we can best support your studies.

Equality and Diversity

The University's Equality, Diversity and Human Rights Procedure can be accessed at the following link: UWS Equality, Diversity and Human Rights Code.

Aligned with the University's commitment to equality and diversity, this module supports equality of opportunity for students from all backgrounds and learning needs. Using the VLE, material will be presented electronically in formats that allow flexible access and manipulation of content. This module complies with University regulations and guidance on inclusive learning and teaching practice. This module has lab-based teaching and as such you are advised to speak to the Module Co-ordinator to ensure that specialist assistive equipment, support provision and adjustment to assessment practice can be put in place, in accordance with the University's policies and regulations

(N.B. Every effort will be made by the University to accommodate any equality and diversity issues brought to the attention of the School)

Supplemental Information

Divisional Programme Board	**Computing**
Overall Assessment Results	☐ **Pass / Fail** ☒ **Graded**
Module Eligible for Compensation	☐ **Yes** ☒ **No**

	If this module is eligible for compensation, there may be cases where compensation is not permitted due to programme accreditation requirements. Please check the associated programme specification for details.
School Assessment Board	Business and Applied Computing
Moderator	Jacob Koenig
External Examiner	M Davis
Accreditation Details	
Module Appears in CPD catalogue	☐ **Yes** ☒ **No**
Changes / Version Number	1.02

Assessment (also refer to Assessment Outcomes Grids below)
Assessment 1
Portfolio of work taken from the module lab exercises (50%)
Assessment 2
Coursework Two (50%)
Assessment 3
(N.B. (i) Assessment Outcomes Grids for the module (one for each component) can be found below which clearly demonstrate how the learning outcomes of the module will be assessed. (ii) An indicative schedule listing approximate times within the academic calendar when assessment is likely to feature will be provided within the Student Module Handbook.)

Component 1							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Essay. Portfolio of practical work	☒	☐	☐	☒	☐	50	32

Component 2							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
Report of practical/ field/ clinical work	☐	☒	☒	☐	☐	50	24

Component 3							
Assessment Type	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**Weighting of Assessment Element (%)**	**Timetabled Contact Hours**
	☐	☐	☐	☐	☐		

Combined total for all components	100%	56 hours

Change Control

What	When	Who
Attendance and Engagement Procedure and Equality and Diversity	17/1/25	F.Valentine
External Examiner updated	22/01/2025	A Adamson