

Prifysgol Wreccsam Wrexham University

Module specification

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Module Code	BUS7E1
Module Title	Predictive Analytics and Machine Learning
Level	7
Credit value	20
Faculty	Social and Life Sciences
HECoS Code	100085
Cost Code	GABP
Pre-requisite module	None

Programmes in which module to be offered

Programme title	Core/Optional/Standalone
MSc International Business and Data Analytics Management	Core
MSc International Business and Data Analytics Management with Advanced Practice	Core

Breakdown of module hours

Learning and teaching hours	20 hrs
Placement tutor support hours	0 hrs
Supervised learning hours e.g. practical classes, workshops	0 hrs
Project supervision hours	0 hrs
Active learning and teaching hours total	20 hrs
Placement hours	0 hrs
Guided independent study hours	180 hrs
Module duration (Total hours)	200 hrs

Module aims

This module provides the essential knowledge and skills required for performing predictive analytics and machine learning. It gives students a thorough understanding of various predictive analytic methods, in particular time-series methods that have wide applications in finance, accounting, economics, marketing and human resources using a graphical user interface (GUI).

Module Learning Outcomes

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

1	Critically evaluate the core concepts and techniques in both predictive analytics and machine learning using a graphical user interface (GUI).
2	Critically analyse both programming languages and computing software packages such as Python, Mplus or MATLAB to use a variety of forecasting models.
3	Critically analyse secondary data analysis using trend analysis, moving average, exponential smoothing and other predictive analytics.
4	Synthesise machine learning to estimate and forecast future events using both single, simultaneous and structural equation modelling.

Assessment

Indicative Assessment Tasks:

This section outlines the type of assessment task the student will be expected to complete as part of the module. More details will be made available in the relevant academic year module handbook.

Assessment 1: (Theoretical)

You are required to critically review the literature, theories and techniques related to any commodity of their own choosing and deliver a 10-minute presentation with 5 minutes questions to discuss the findings.

Assessment 2: (Empirical)

In this assessment you will be assessed progressively by your ability to apply the predictive analytic knowledge in the first assessment (such as trend models, moving-average models, exponential-smoothing models, lag-distribution models and others) by using a graphical user interface (GUI). These predictive analytics can be applied to any variable, any commodity or any market of the student's choosing, such as predicting inflation, market share forecasts, airline forecasting or others.

Assessment number	Learning Outcomes to be met	Type of assessment	Duration/Word Count	Weighting (%)	Alternative assessment, if applicable
1	1, 2	Presentation	15 minutes	30%	N/A
2	3, 4	Coursework	2,500 words	70%	N/A

Derogations

None

Learning and Teaching Strategies

The learning and teaching strategy will consist of formal lectures and/or guest lecturers to present theory, principles and practices which will form the foundation of the learning outcomes. Students will be encouraged to interact and contribute to classroom learning as a means of developing critical skills, and to strengthen their knowledge and understanding of theory to practice. Lectures will be structured to encourage individual and group activities using real world case studies and live business examples enabling students to develop their collaborative, decision making, judging and evaluating skills, as well as key transferable employability skills. In addition, students will be encouraged to undertake self-directed study and further research on their chosen area of study, as well as related topics, to acquire additional perspectives which will provide them with a greater understanding of the business topics within organisations and the wider environment.

Welsh Elements

Students have an option to submit the assessments and receive feedback for the module in Welsh. Case studies and contextualised Welsh examples will also be implemented within the module where possible.

Indicative Syllabus Outline

- Stationary, co-integration and error correction models
- Asset price volatility, ARCH, GARCH models
- Exponential smoothing, Box Jenkin, ARIMA Models
- Dynamic and Hierarchical Models
- Python for Data Analysis
- Python and a Graphical User Interface (GUI)
- Special Topics in Predictive Analytics
- Special Topics in Machine Learning

Indicative Bibliography

Please note the essential reads and other indicative reading are subject to annual review and update.

Essential Reads:

Hyndman, R.J. and Athanasopoulos, G. (2021) *Forecasting: Principles and Practice*. 3rd edn. Melbourne: OTexts.

Other indicative reading:

Amos, D., Bader, D., Jablonski, J. and Heisler, F. (2021) *Python Basics: A Practical Introduction to Python 3*. Vancouver: Real Python.

Journals

Predictive analytics
Machine learning
Data analytics
Statistics for business
Business insights and analytics
Business strategy
The economists

Administrative Information

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Initial approval date	8 th August 2022
With effect from date	January 2023
Date and details of revision	10.09.2026: CMAP approved revisions to the assessment structure, reducing the Assessment 1 presentation duration and removing the Assessment 2 online presentation (AM1).
Version number	02