

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

Programmes in which module to be offered

Programme title	Is the module core or option for this programme
MSc International Business and Data Analytics Management	Core pathway
MSc International Business and Data Analytics Management with Advanced Practice	Core pathway

Pre-requisites

None

Breakdown of module hours

Learning and teaching hours	20 hrs
Placement tutor support	0 hrs
Supervised learning e.g. practical classes, workshops	0 hrs
Project supervision (level 6 projects and dissertation modules only)	0 hrs
Total active learning and teaching hours	0 hrs
Placement / work based learning	0 hrs
Guided independent study	180 hrs
Module duration (total hours)	200 hrs

For office use only	
Initial approval date	8 th August 20022
With effect from date	January 2023
Date and details of revision	
Version number	1

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 One (Theoretical) (30%)

You are required to critically review the literature, theories and techniques related to any commodity of their own choosing, and deliver a 30 minute presentation to discuss the findings.

Assessment Two (Empirical) (70%)

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. Students are required to deliver a 10 minute online presentation to discuss the findings as part of their assessment **(2,500 words)**.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)
1	1, 2	Presentation	30%
2	3, 4	Coursework	70%

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.

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:

Essential Reads

Hyndman, Rob J. and Athanasopoulos, George. (2021). *Forecasting: Principles and*, Third Edition, Melbourne, Australia, Publisher: OTexts,

Other indicative reading

Amos, David., Bader, Dan., Jablonski, Joanna. and Heisler, Fletcher (2021). **Python Basics: A Practical Introduction to Python 3**, Paperback Edition, Vancouver, Real Python.

Journals

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

Employability skills – the Glyndŵr Graduate

Each module and programme is designed to cover core Glyndŵr Graduate Attributes with the aim that each Graduate will leave Glyndŵr having achieved key employability skills as part of their study. The following attributes will be covered within this module either through the content or as part of the assessment. The programme is designed to cover all attributes and each module may cover different areas.

Core Attributes

Engaged
Enterprising
Creative
Ethical

Key Attitudes

Commitment
Curiosity

Practical Skillsets

Digital Fluency
Organisation
Communication