## H8TSFA: Time Series & Financial Analytics

Module Code:		H8TSFA				
Long Title		Time Series & Financial Analytics APPROVED				
Title		Time Series & Financial Analytics				
Module Level:		LEVEL 8				
EQF Level:		6				
EHEA Level:		First Cycle				
Credits:		10				
Module Coordinator:		FONY DELANEY				
Module Author:		TONY DELANEY				
Departments:		School of Computing				
Specifications of the qualifications and experience required of staff		Masters' Degree or PhD in a computing or cognate discipline. May have industry experience also.				
Learning Outco	mes					
On successful completion of this module the learner will be able to:						
#	Learning Outcome	Description				
LO1	Analyse time series	ie series using appropriate techniques.				
LO2	Compare and contra	Compare and contrast alternative models to assist with forecasting.				
LO3	Source data ethically and communicate forecasts in a comprehensive and professional manner.					
LO4	Apply forecasting teo	Apply forecasting techniques to data exhibiting heteroscedacity.				
LO5	Implement quantitati	lement quantitative techniques to optimise portfolios, measure performance and value financial assets .				
LO6	Evaluate the role of	luate the role of data analytic approaches in Financial Markets.				
Dependencies						
Module Recommendations						
No recommendations listed						
Co-requisite Modules						
No Co-requisite modules listed						
Entry requirem	ents	Learners should have attained the knowledge, skills and competence gained from stage 3 of the BSc (Hons) in Data Science				

## H8TSFA: Time Series & Financial Analytics

Module Content & Assessment						
Indicative Content						
Introduction to Time Series Concepts Decomposition of Time Series. Adjusting for Inflation. Stationarity. Data Transformations. Ethical data sourcing						
Fundamental Time Series Concepts Mean & Linear Trend models. Random Walk Models. Averaging & smoothing models						
Regression Models with Time Series Regression models with time series.						
ARIMA models I Non-seasonal ARIMA models. Orders o	f AR and MA terms. Model estimation					
ARIMA models II Seasonal ARIMA models. Identifying a s	suitable model					
Autoregressive Conditional Heterosc ARCH (1).	edacticity I					
Autoregressive Conditional Heteroso GARCH models.	edacticity II					
Portfolio Optimisation Markowitz portfolio theory. Portfolio risk	and return. The diversification effect. Me	easuring Beta				
Performance Measurement in Investment Markets Performance and risk. Sharpe Index. Trevnor's Measure. Jensen's Measure. Information Ratio						
Financial Indices Construction of stock market indices. Co	onstruction of price indices.					
Discounted cash flow models DCF and bond valuation. Dividend disco	ount models. Relative valuation of equitie	PS.				
Data Analytic approaches to Financia Quantitative and high frequency trading	<b>al Markets</b> . Big data and risk assessment					
Assessment Breakdown			%			
Coursework			40.00%			
End of Module Assessment			60.00%			
Assessments			ŀ			
Full Time						
Coursework						
Assessment Type:	Formative Assessment	% of total:	Non-Marked			
Assessment Date:	n/a	Outcome addressed:	1,2,3,4,5,6			
Non-Marked:	Yes					
Assessment Description: Formative assessment will be undertaken utilising exercises and short answer questions during certain tutorials. In class discussions will be undertaken on contemporary topics. Feedback will be provided individually or as a group in oral format.						
Assessment Type:	Continuous Assessment	% of total:	40			
Assessment Date:	n/a	Outcome addressed:	1,3,4			
Non-Marked:	No					
Assessment Description: Learners will be asked to source financial data and undertake a significant forecasting exercise using time series techniques. The project will assess practical application						

relating to LO1, LO3 and LO4 Project data should be sourced in an ethical manner and application made for ethical approval where required in accordance with School policy End of Module Assessment

Assessment Type:	Terminal Exam	% of total:	60				
Assessment Date:	End-of-Semester	Outcome addressed:	1,2,3,4,5,6				
Non-Marked:	No						
Assessment Description:							

The examination will be in the region of two hours in duration and may include a mix of: theoretical, applied and interpretation questions. Assessment of LO1, LO3 and LO4 will cover theoretical and conceptual dimensions

No Workplace Assessment

Reassessment Requirement

Repeat examination

Reassessment of this module will consist of a repeat examination. It is possible that there will also be a requirement to be reassessed in a coursework element. **Reassessment Description** 

The repeat strategy for this module is an examination. All learning outcomes will be assessed in the repeat exam.

## H8TSFA: Time Series & Financial Analytics

Module Workload								
Module Target Workload Hours 0 Hours								
Workload: Full Time								
Workload Type	Workload Description	Hours	Frequency	Average Weekly Learner Workload				
Lecture	Classroom & Demonstrations (hours)	24	Per Semester	2.00				
Tutorial	Other hours (Practical/Tutorial)	24	Per Semester	2.00				
Independent Learning	Independent learning (hours)	202	Per Semester	16.83				
Total Weekly Contact Hours								

## Module Resources

Recommended Book Resources

Hyndman, R. & Athanasopoulos, G.. (2017), Forecasting: Principles and Practice 2e, O Texts.

Tsay, R.S.. (2013), An Introduction to analysis of financial data with R, Wiley, New York.

DeFusco, R., McLeavey, D., Pinto, J. & Runkle, D.. (2015), Quantitative Investment Analysis, Wiley, New Jersey.

Supplementary Book Resources

Brooks, C.. (2008), Introductory Econometrics for Finance (2nd ed), Cambridge University Press, Cambridge.

This module does not have any article/paper resources

This module does not have any other resources

Discussion Note: