Subject Description Form

Subject Code	AMA465
Subject Title	Forecasting and Applied Time Series Analysis
Credit Value	3
Level	4
Pre-requisite/ Co-requisite/ Exclusion	Pre-requisite: Applied Statistical Methods (AMA263 or AMA2631) or Statistical Inference (AMA364)
Objectives	This subject is to introduce to students basic concepts and techniques of time series and forecasting. An applied approach will be emphasized.
Intended Learning Outcomes	Upon satisfactory completion of the subject, students should be able to: 1. state the basic theory of time series analysis and forecasting approaches; 2. synthesize the relevant statistical knowledge and techniques for forecasting; 3. identify, define and formulate forecasting problem, and use procedures in popular statistical software for the analysis of time series and forecasting; 4. interpret analysis results and make recommendations for the choice of forecasting methods; 5. produce and evaluate forecasts for given time series; 6. present analysis results of forecasting problems.
Subject Synopsis/ Indicative Syllabus	*Introduction to forecasting and smoothing models (6 hours)* Forecasting and time series, forecasting methods and errors, choosing a forecasting technique, simple exponential smoothing and double exponential smoothing. *Nonseasonal Box-Jenkins models and their identification (12 hours)* Stationary and nonstationary time series, sample autocorrelation and partial autocorrelation function, tentative identification of ARMA models. *Estimation, diagnostic checking, and forecasting for nonseasonal Box-Jenkins Models (15 hours)* Estimation, diagnostic checking, forecasting and case study. *Conditional heteroscedastic time series models (9 hours)* ARCH and GARCH models, estimation and testing.
Teaching/Learning Methodology	The subject will be delivered mainly through lectures and tutorials. The lectures will be conducted to introduce the concepts of forecasting and applied time series analysis in the syllabus, which are then reinforced by learning activities involving demonstration, tutorial exercise and assignments/mini-project.

Assessment Methods in Alignment with Intended Learning Outcomes	Specific assessment methods	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
			1	2	3	4	5	6
	a. Assignments/ Mini-project	20%	✓	✓	✓	✓	✓	✓
	b. Tests	20%	✓	✓		✓	✓	
	c. Examination	60%	✓	✓		✓	✓	✓
	Total	100 %						

Continuous Assessment comprises of assignments and/or mini-project, and tests. A written examination is held at the end of the semester.

To pass this subject, students are required to obtain Grade D or above in **both** the Continuous Assessment and the Examination components in order to satisfy all the intended learning outcomes.

Student Study Effort Required	Class contact:	
	▪ Lecture	28 Hrs.
	▪ Tutorial	14 Hrs.
	Other student study effort:	
	▪ Assignment/mini-project/laboratory	30 Hrs.
	▪ Self-study	36 Hrs.
	Total student study effort	108 Hrs.

Reading List and References	Textbook:		
	Chatfield, C.	The Analysis of Time Series: An Introduction 6th edition	Chapman and Hall 2003
	References:		
	Tsay, R.S.	Analysis of Financial Time Series 3rd edition	Wiley-Interscience 2010
	Cryer, J.D. & Chan, K.S.	Time Series Analysis with Applications in R 2nd edition	Springer-Verlag 2008