

Subject Code	MM5413
Subject Title	Business Forecasting
Credit Value	3
Level	5
Pre-requisite/ Co-requisite/ Exclusion	Business Intelligence and Decisions (MM5412) or Business Analytics (MM5425)
Objectives	<p>Forecasting is used to predict future events or conditions. Due to the increasing availability of different data types in business, forecasting methods have become increasingly important in different business situations. Forecasts may be either subjective or objective. The first part of this course will introduce the fundamentals of applying time series analysis to support business forecast, planning, and decision-making.</p> <p>Advancements in business intelligence and financial technologies (FinTech) have given rise to techniques to process firm data and decipher business documents. Lying at the core of these techniques is deep learning that models both structured and unstructured inputs to extract signals that affect customer behaviors and business outcomes. The second part of this course will cover deep learning models and their applications in business forecasting.</p> <p>This subject contributes to the achievement of the MSc BA Programme Outcome 2 (Demonstrate the ability to think critically and creatively within the domain of business analytics and be proficient in analytics tools, such as data mining techniques as provided in Python).</p>
Intended Learning Outcomes	<p>Upon completion of the subject, students will be able to:</p> <ol style="list-style-type: none"> Understand the importance of forecasting in making accurate decisions in business environments. Understand the basics of regression, time series, and forecasting applications. Understand how to handle the trend, seasonal and cyclical issues in forecasting analysis. Know the basics of deep learning well enough to interact with business analysts, data scientists, engineers, and machine learning developers. Be able to apply different deep learning models to analyze data for business forecasting.
Subject Synopsis/ Indicative Syllabus	<ol style="list-style-type: none"> Characteristics of Time Series Data Time Series Regression (Linear, Exponential, and Quadratic) Dummy Variable Regression for Modeling Seasonality Introduction to AR, MA, ARMA, and ARIMA Panel Data Analysis (Pooled OLS and Fixed Effect Model) Neural Network and Multilayer Perceptron Variants of Deep Learning (e.g., Autoencoder, CNN, LSTM) Applications of Deep Learning in Business Forecasting Management Judgement in Business Forecasting
Teaching/Learning Methodology	<p>The subject will be taught via lectures and labs with various methods as its pedagogy to help students achieve the above learning outcomes.</p> <ol style="list-style-type: none"> General announcement and an opportunity for students to ask questions to address any unfinished thoughts from the previous class; Overview of the current class agenda and its relationship to past

discussion;

3. Extended period of students- or instructor-led discussion and practice of the assigned cases or exercises. Collaborative learning strategies (learning via discussion in a small group) may be employed during part of this time;
4. Lab sessions with real-world data to provide students with hands-on experiences of using Python.

Assessment Methods in Alignment with Intended Learning Outcomes

Specific assessment methods/tasks	% weighting	Intended subject learning outcomes to be assessed (Please tick as appropriate)					
		a	b	c	d	e	
1. Classroom Performance	20%	✓	✓	✓	✓	✓	
2. Individual Assignments	30%	✓	✓	✓	✓	✓	
3. Quizzes	15%	✓	✓	✓	✓	✓	
4. Group Project	35%	✓	✓	✓	✓	✓	
Total	100 %						

Notes:

1. *Weighting of assessment methods/tasks in continuous assessment may be different, subject to each subject lecturer.*
2. *To pass this subject, students are required to obtain Grade D or above in the overall subject grade.*

To reflect the significant technology content in this subject, 10% (or more) of the overall weighting of this subject is based on individual assessments concerning technology-related knowledge.

Explanation of the appropriateness of the assessment methods in assessing the intended learning outcomes:

1. Classroom performance includes students’ active participation, feedback, and contribution in class, as well as classwork exercises and Q&A. Its purpose is to assess students’ understanding of key techniques in individual topics.
2. Individual assignments will assess students’ capability to handle data and apply forecasting methods. Students’ writing skills and logical thinking processes will also be examined.
3. Quizzes are a good tool to test students’ comprehensive power, critical thinking, and analytical ability.
4. Group project enables students to work as a team to conduct a more in-depth analysis of a selected topic and apply the forecasting methods to a real business situation. It assesses their knowledge and research, presentation, and writing skills.

The above methods are designed to ensure a balanced learning experience for all students taking this subject.

Student Study Effort Expected	Class contact:	
	▪ Lectures & Labs	39 Hrs.
	Other student study effort:	
	▪ Preparation of Lectures & In-class Quizzes	26 Hrs.
	▪ Preparation of Individual Assignments, Group Project, and Project Presentation	60 Hrs.
	Total student study effort	125 Hrs.
Reading List and References	<p>All course materials (Lecture slides, assignments, and lab handouts) are available on the course website.</p> <p>Reference Books:</p> <ul style="list-style-type: none"> ▪ Diebold, Francis X. <i>Elements of Forecasting</i>. South-Western College Pub. (latest version) ▪ Makridakis, Spyros, and Steven C. Wheelwright. <i>Forecasting Methods for Management</i>. (latest version). ▪ Andrew W. Trask. <i>Grokking Deep Learning</i>. (latest version) ▪ N. D Lewis. <i>Deep Time Series Forecasting with Python</i>. (latest version) 	

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