Subject Description Form

Subject Code	AMA4370
Subject Title	Applied Algorithmic Trading Strategies
Credit Value	3
Level	4
Pre-requisite / Co-requisite/ Exclusion	Nil
Objectives	The objective of this course is to equip students with a comprehensive understanding of algorithmic trading strategies and their practical application in financial markets. The curriculum will encompass key concepts, techniques, and tools essential for designing, implementing, and evaluating algorithmic trading strategies. Students will have the opportunity to gain hands-on experience by creating and testing their trading algorithms using both historical and real-time market data.
Intended Learning Outcomes	Upon completion of the subject, students will be able to: (a) Understand the principles of algorithmic trading strategies and their applications within the financial industry; (b) Design, implement and execute trading strategies utilizing computational tools; (c) Evaluate the performance and manage risks associated with trading strategies.; (d) Incorporate cutting-edge techniques, such as alternative data and machine learning, into the development of trading strategies; (e) Demonstrate an understanding of the ethical considerations and regulatory knowledge about trading practices.
Subject Synopsis/ Indicative Syllabus	**Quantitative Trading Strategies** Quant trading strategies such as trend-following, mean-reversion and statistical arbitrage. Design, develop and back-test the trading strategies in Python with market data **Execution Algorithms** Algorithmic Execution Trading for large orders such as Iceberg, VWAP/TWAP, Implementation Shortfall, Market-on-Close, Market-Making for institutional clients **Recent Trends**

<table>
<tr><td></td><td>Explore the latest techniques used in the Algorithmic Trading Strategies including Alternative Data, Machine Learning and Sentiment Analysis</td></tr>
<tr><td>Teaching/Learning Methodology</td><td>The subject will mainly be delivered through lectures and lab-based tutorials. The lectures will be conducted to introduce the concept and applications of algorithmic trading strategies as outlined in the syllabus. These lectures will be reinforced by various learning activities, including case discussions on real-world use cases and computational project presentations using Python and market data.</td></tr>
<tr><td>Assessment Methods in Alignment with Intended Learning Outcomes</td><td>
<table>
<tr><td rowspan="2">Specific assessment methods/tasks</td><td rowspan="2">% weighting</td><td colspan="5">Intended subject learning outcomes to be assessed (Please tick as appropriate)</td></tr>
<tr><td>a</td><td>b</td><td>c</td><td>d</td><td>e</td></tr>
<tr><td>1. Project</td><td>50%</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td></tr>
<tr><td>2. Midterm Test</td><td>20%</td><td>✓</td><td></td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>3. Examination</td><td>30%</td><td>✓</td><td></td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>Total</td><td>100%</td><td colspan="5"></td></tr>
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<u>Project</u>
This subject focus on the practical implementation of algorithmic trading strategies. A project worth 50% is deemed suitable for assessing the intended learning outcomes (a, b, c, d, e).

The project involves developing a real-time algorithmic trading strategy using the Python-based trading platform (ProfitView). By completing this project, students will gain hands-on experience in developing and testing algorithmic trading strategies, working with real-time market data, and implementing sound risk management practices.

<u>Midterm Test and Exam</u>
While some of the course content is based on theoretical concepts and industrial knowledge, an exam-based assessment approach is deemed appropriate. This will include a 20% midterm test and a 30% final examination.
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<tr><td>Student Study Effort Expected</td><td>Class contact:</td><td></td></tr>
<tr><td></td><td>▪ Lecture</td><td>26 Hrs.</td></tr>
<tr><td></td><td>▪ Tutorial</td><td>13 Hrs.</td></tr>
<tr><td></td><td>Other student study effort:</td><td></td></tr>
</table>

	▪ Assignments/Quizzes/Project	40 Hrs.
	▪ Self-study and other related work	30 Hrs.
	Total student study effort	109 Hrs.
Reading List and References	**References:** 1. Hilpisch, Y. *Python for algorithmic trading: From idea to cloud deployment*, O'Reilly Media 2021 2. Stefan Jansen. *Machine Learning for Algorithmic Trading: Predictive models to extract signals from market and alternative data for systematic trading strategies with Python*, Packt; 2nd Edition 2020 3. Aldridge, Irene. *High-Frequency Trading: A Practical Guide to Algorithmic Strategies and Trading Systems*, Wiley; 2nd edition 2013 4. Leshik, E., Cralle, J. *An Introduction to Algorithmic Trading: Basic to Advanced Strategies*, Wiley & Sons 2011	