# HKUST Department of Economics

# Artificial Intelligence in the Asset Management Industry
# ECON6130A

## Course Outline: Spring 2026

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## Course Description

This course explores some of the practical applications of Artificial Intelligence (AI) in the asset management industry. It will cover how AI techniques are utilized in investment processes, marketing and client service at asset management firms, as well some of the issues that use of AI involves. Students will learn and use some of the main models used in the industry drawn from Machine Learning, Artificial Neural Networks (ANN) and Natural Language Processing (NLP). The focus will be on application rather than theory.

By the end of the course, students should have a firm understanding of the following:

1. Some of the ways in which AI is having an impact on the industry
2. How a selection of the most important models may be used in common tasks in the asset management industry
3. Issues that use of AI brings to the asset management industry

The lectures will make substantial use of computer code (in Python). Students will use and adapt pre-written code as part of the principal assignment in the course. Whilst this is not a course in computing, students must have an aptitude for and willingness to use computer code.

## Course Outline

The course covers the following topics:

1. Introduction to the asset management industry (topics relevant to understand how the industry is using AI)
2. Machine Learning methods in the investment process:
   i) Logistic regression
   ii) Linear/Quadratic Discriminant Analysis
3. Artificial Neural Networks in the investment process:
   i) Recurrent Neural Networks and document classification
   ii) Recurrent Neural Networks and time series prediction
4. Natural Language Programming in the investment process:

i) Introduction: word2vec and word embeddings

ii) Transformers and Large Language Models

iii) BERT models and document classification

iv) BERT models and sentiment analysis

v) BERT models and predicting stock returns

5. AI in marketing: use of models to predict buyers of financial products
   i) K Nearest Neighbours
   ii) Logistic regression
   iii) Linear/Quadratic Discriminant Analysis
6. Use of Large Language Models in client service
7. Issues with the use of AI

## Assessment

Assessment is in two parts:

1. Four Canvas quizzes – 40% of final course score (10% each quiz)
2. An essay assignment – 60% of final course score

The essay assignment will require students to write a 3,000 word essay that presents results of model estimation of time series data to predict stock returns. Students will either use pre-written code and existing time series data, or else their own code and time series data. They will examine whether a range of models presented in the course can successfully generate positive returns. 15%-20% of the essay grade will be earned by explaining how students have used AI in carrying out the assignment, including writing the essay.

More details of the essay assignment will be presented at the first lecture.

## Recommended readings

The course will use two textbooks (both available online):

1. Introduction to Statistical Learning with Applications in Python, James G. et al, 2023
2. Speech and Language Processing, Jurafsky D. & Martin J., 2025

Additional readings will be assigned as the course progresses.

## Learning Outcomes - School Intended Learning Outcomes ("SILOs")

Upon successful completion of this course, students should be able to:

1) Identify some of the main uses of AI at asset management companies; (SILO # 4, 6)
2) Understand some of the main AI models, and be able to apply them to a range of classification and prediction tasks
3) Critically assess the ability of AI models to undertake the tasks that the asset management industry is expecting from them; (SILO # 4, 6)

4) Understand and critically assess the main challenges that use of AI involves in the asst management industry; (SILO # 4, 6)
5) Understand the application of some of the most important models in AI. (SILO # 2, 4, 6);