

# **FIN313 Machine Learning and AI for FinTech**

**Level:** 3

**Credit Units:** 5 Credit Units

**Language:** ENGLISH

**Presentation Pattern:** EVERY JAN

## **Synopsis:**

FIN313 Machine Learning and AI for FinTech builds on the foundation from FIN312 to give an introduction to machine learning techniques in the handling of large datasets – the basis of AI. Students will learn fundamental concepts from the field, including supervised/unsupervised learning, bias-variance tradeoff, principal component analysis and neural networks. The course is peppered with examples of learning of datasets from finance. Students will be equipped with the understanding of how AI is applied in finance and the skill to implement machine learning algorithms to extract key features from financial datasets.

## **Topics:**

- Supervised and unsupervised learning
- Structured and unstructured data handling
- Prediction accuracy – bias-variance tradeoff
- Model interpretability
- Regression and classification
- ML models
- Deep learning
- Model testing using cross validation and bootstrapping
- Dimension reduction – ridge and lasso regression
- Principal component analysis
- Neural networks
- Python packages – numpy, scipy, pandas, scikit-learn and statsmodels

## **Textbooks:**

Muller, A. C. & Guido S.: Introduction to Machine Learning with Python: A Guide for Data Scientists, 1st Edition (eText) 1st Edition O'Reilly Media  
ISBN-13: 9781449369897

**Learning Outcome:**

- Distinguish between supervised machine learning (ML), unsupervised ML, deep learning and artificial intelligence.
- Design and implement supervised ML algorithms to apply to financial datasets.
- Examine and interpret ML models' outputs and translate outputs into appropriate business decisions in financial settings.
- Operate with high-dimensional financial datasets.
- Formulate business requirements in Python code for automation.
- Use suitable Python packages to build ML models for prediction or classification tasks.

**Assessment Strategies (Evening Class):**

<b>Components</b>	<b>Description</b>	<b>Weightage Allocation (%)</b>
Overall Continuous Assessment	CLASS TEST 1	5
	GROUP BASED ASSIGNMENT 1	25
	PARTICIPATION 1	10
Overall Examinable Components	Written Exam	60
<b>Total</b>		<b>100</b>