

課程中文名稱 Title of Course in Chinese : **智慧金融量化分析**

課程英文名稱 Title of Course in English : **Artificial Intelligence in Finance and Quantitative Analysis**

應修系級 Major : **資訊管理研究所2** ,

授課教師 Instructor : **戴敏育**

選修類別 Required/Elective : **選**

全半學年 Whole or Half of the Academic Year : **半**學年

學 分 Credit(s) : **3** 學分

時 數 Hour(s) : **3** 小時

教師網址 Instructor's Website : <http://web.ntpu.edu.tw/~myday/>

教師專長 Instructor's Specialty : **電子商務 (Electronic Commerce), 金融科技 (Financial Technology), 人工智慧 (Artificial Intelligence), 大數據分析 (Big Data Analytics), 資料探勘與文字探勘 (Data Mining and Text Mining)**

課綱附檔 Attachments :

先修科目 : **無**

Prerequisites : **None**

教學目標 :

1. 瞭解智慧金融量化分析基本概念與研究議題。
2. 具備智慧金融量化分析實務操作能力。
3. 進行智慧金融量化分析相關之資訊管理研究。

Course Objectives :

1. Understand the fundamental concepts and research issues of Artificial Intelligence in Finance and Quantitative Analysis.
2. Equip with Hands-on practices of Artificial Intelligence in Finance and Quantitative Analysis.
3. Conduct information systems research in the context of Artificial Intelligence in Finance and Quantitative Analysis.

內容綱要 :

本課程介紹智慧金融量化分析基本概念、研究議題、與實務操作。課程內容包括智慧金融量化分析概論、AI 金融科技: 金融服務創新應用、投資心理學與行為財務學、財務金融事件研究法、財務金融理論、數據驅動財務金融、金融計量經濟學、人工智慧優先金融、財務金融深度學習、財務金融強化學習、演算法交易、風險管理、交易機器人與基於事件的回測、與智慧金融量化分析個案研究。

Course Outline :

This course introduces the fundamental concepts, research issues, and hands-on practices of AI in Finance and Quantitative Analysis. Topics include Introduction to Artificial Intelligence in Finance and Quantitative Analysis, AI in FinTech: Financial Services Innovation and Application, Investing Psychology and Behavioral Finance, Event Studies in Finance, Finance Theory, Data-Driven Finance, Financial Econometrics, AI-First Finance, Deep Learning in Finance, Reinforcement Learning in Finance, Algorithmic Trading, Risk Management, Trading Bot and Event-Based Backtesting, and Case Study on AI in Finance and Quantitative Analysis.

學生核心能力關連(Student's Core Competence) :  
(八大核心能力為百分比; 合計100%; Total 100%)

資訊管理研究所 110年 系核心能力 :  
資訊科技新知探索與系統開發應用 **80 %**  
網路行銷企劃能力 **10 %**  
論文寫作與獨立研究能力新知 **10 %**

[=]

**校四大基本素養**  
**Four Fundamental Qualities**

專業 Professionalism		人際 Interpersonal Relationship		倫理 Ethics		國際觀 International Vision	
創意思考 與問題解 決 (Creative thinking and Problem- solving) 40 %	綜合統整 (Comprehensive Integration) 40 %	溝通協調 (Communication and Coordination) 10 %	團隊合作 (Teamwork) 5 %	誠信正直 (Honesty and Integrity) 0 %	尊重自省 (Self- Esteem and Self- reflection) 0 %	多元關懷 (Caring for Diversity) 0 %	跨界宏觀 (Interdisciplinary Vision) 5 %

商學院學習目標(College Learning Goals) :  
Ethics/Corporate Social Responsibility  
Global Knowledge/Awareness  
Communication  
Analytical and Critical Thinking

系所學習目標(Department Learning Goals) :  
Information Technologies and System Development Capabilities  
Internet Marketing Management Capabilities  
Research capabilities

教學進度(Teaching Contents) :

週別 (Weekly Schedule)	日期 (Date)	教學預定進度 (Tentative teaching schedule) (若有調整，依教師實際授課為準; Adjustments are made according to instructor's actual teaching schedule)	教學方法與教學活動 (Teaching methods and activities)
Week 1	20210928	智慧金融量化分析概論 (Introduction to Artificial Intelligence in Finance and Quantitative Analysis)	講授Lecture 討論Discussion 實習Practicum
Week 2	20211005	AI 金融科技: 金融服務創新應用 (AI in FinTech: Financial Services Innovation and Application)	講授Lecture 討論Discussion 實習Practicum
Week 3	20211012	投資心理學與行為財務學 (Investing Psychology and Behavioral Finance)	講授Lecture 討論Discussion 實習Practicum
Week 4	20211019	財務金融事件研究法 (Event Studies in Finance)	講授Lecture 討論Discussion 實習Practicum
Week 5	20211026	智慧金融量化分析個案研究 I (Case Study on AI in Finance and Quantitative Analysis I)	討論Discussion
Week 6	20211102	財務金融理論 (Finance Theory)	講授Lecture 討論Discussion 實習Practicum
Week 7	20211109	數據驅動財務金融 (Data-Driven Finance)	講授Lecture 討論Discussion 實習Practicum
Week 8	20211116	期中報告 (Midterm Project Report)	討論Discussion
Week 9	20211123	金融計量經濟學 (Financial Econometrics)	講授Lecture 討論Discussion 實習Practicum
Week 10	20211130	人工智慧優先金融 (AI-First Finance)	講授Lecture 討論Discussion 實習Practicum
Week 11	20211207	智慧金融量化分析產業實務 (Industry Practices of AI in	討論Discussion

		Finance and Quantitative Analysis )	
Week 12	20211214	智慧金融量化分析個案研究 II (Case Study on AI in Finance and Quantitative Analysis II)	討論Discussion
Week 13	20211221	財務金融深度學習 (Deep Learning in Finance) 財務金融強化學習 (Reinforcement Learning in Finance)	講授Lecture 討論Discussion 實習Practicum
Week 14	20211228	演算法交易 (Algorithmic Trading) 風險管理 (Risk Management) 交易機器人與基於事件的回測 (Trading Bot and Event-Based Backtesting)	講授Lecture 討論Discussion 實習Practicum
Week 15	20220104	期末報告 I (Final Project Report I)	討論Discussion
Week 16	20220111	期末報告 II (Final Project Report II)	討論Discussion
Week 17	20220118	學生自主學習 (Self-learning)	討論Discussion
Week 18	20220125	學生自主學習 (Self-learning)	討論Discussion

評量方式(Evaluation Methods) :

課堂之前測(Pre-test) 0 %

課堂之隨堂測驗(Quiz) 0 %

期中考-筆試(Mid-Term) 0 %

期末考-筆試(Final Exam) 0 %

個案分析報告(Case Report) 10 %

課堂參與(Class Participation) 10 %

個人報告(Individual Presentation) 60 %

團體報告(Group Presentation) 10 %

作業(Assignment) 10 %

其他評量方式(Other Evaluation Methods)

指定用書(Required Texts) :

Yves Hilpisch (2020), Artificial Intelligence in Finance: A Python-Based Guide, O'Reilly Media.

參考書目(Reference Books) :

Aurélien Géron (2019), Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow: Concepts, Tools, and Techniques to Build Intelligent Systems, 2nd Edition, O'Reilly Media.

Yves Hilpisch (2018), Python for Finance: Mastering Data-Driven Finance, 2nd Edition, O'Reilly Media.

其他參考資料(Other References) :

Paolo Sironi (2016), FinTech Innovation: From Robo-Advisors to Goal Based Investing and Gamification, Wiley.

Yuxing Yan (2017), Python for Finance: Apply powerful finance models and quantitative analysis with Python, Second Edition, Packt Publishing

『請遵守智慧財產權』及『不得非法複製及影印』

Please respect intellectual property rights and do not illegally copy or print materials.