

課 綱 Course Outline

理工學院 碩士班

中文課程名稱 Course Name in Chinese	金融科技導論				
英文課程名稱 Course Name in English	Introduction to FinTech				
科目代碼 Course Code	TCAI50050	班 別 Degree	碩士班 Master' s		
修別 Type	選修 Elective	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite	Calculus: Basic differentiation, differentiation to find optimum Linear algebra: Matrix operations, determinant, eigenvalue/eigenvector Probability: Discrete/continuous random variables Machine learning: Basic idea of training/test for model construction, preferably with hands-on experience				
課程目標 Course Objectives					
<p>金融科技(Financial Technology, FinTech)是目前全球金融業與科技業的焦點，它所引發的破壞式創新，正挑戰既有金融服務的供給方式和消費行為。</p> <p>本課程旨在釐清 FinTech 本質、相關的創新科技、以及關鍵的趨勢。同時我們也會在課程當中邀請相關學者專家進行演講，並在金融機構（或金融科技新創公司）的協助之下完成期末的 AI 程式競賽。歡迎想參與或是有志於跨金融與科技領域的同學們，來共同探索此新興領域 - FinTech。</p>					
課程大綱 Course Outline					

1. Intro to the course 2. Math for fintech 3. Technical indicators, quantitative trading, backtest, dynamic programming 4. Intro to bitcoin and blockchain 5. Hash function and elliptic curve digital signature algorithm (ECDSA) 6. Portfolio optimization 7. Ethereum and Other Blockchain/Cryptocurrency 8. Performance indices, feature selection for ML 9. Missing data imputation in ML 10. Imbalanced dataset, cost-sensitive classification 11. Advanced Functions and Post-Quantum Cryptography for Blockchain 12. Intro to the final project 13. Invited talk by guest speaker 14. Invited talk by guest speaker 15. AI/ML applications in finance 16. Heads-up for final project.
資源需求評估(師資專長之聘任、儀器設備的配合．．．等) Resources Required(e.g. qualifications and expertise, instrument and equipment, etc.)
課程要求和教學方式之建議 Course Requirements and Suggested Teaching Methods
評量方式 Evaluation methods ●作業成績：40% ●期末考成績：30% ●其他：30%
其他 Miscellaneous