

管院碩士班(含碩專班)課程大綱

MS/MA Program Syllabus

2023.09.26 修訂

系所 Department	財金所 Finance		必修 compulsory/elective	選修 Elective
課程名稱 Course title	財務工程		學分數 Credit(s)	3
課號 Course Code	5156241 01		全英文授課 English Taught(EMI)	是(Yes)
學年/學期 academic year/Semester	115/01		上課地點 Classroom	管理學院 350
講授教師 Instructor	葉宗瑋		上課時間 Time	一 3,4,5
教師辦公室&諮詢時間 Instructor office & office hour			教師聯絡資訊 Instructor Contact	Phone: Email:
助教 Teaching assistant			助教 聯絡資訊 TA contact	Email:
先修課程 Pre-requisite courses	微積分、統計學			
學習目標 Learning Objective	Upon completing this course, students will be able to: ● Explain and apply the no-arbitrage principle and the fundamental theorems of asset pricing to determine the existence and uniqueness of arbitrage-free derivative prices; ● Use stochastic calculus and risk-neutral valuation techniques to derive and interpret pricing relationships for derivatives; ● Critically evaluate empirical research on option prices and returns and interpretation of findings.			
課程概述 Course Descriptions	A graduate course on the theory and practice of derivative pricing. The first half builds the pricing framework — no-arbitrage and the fundamental theorems, stochastic calculus, and the Black–Scholes model. The second half turns to models beyond Black–Scholes, the volatility surface and its derivatives, and empirical option-return research carried out through paper presentations and a final project.			
對應 AOL 職能素養(AOL Competency)				
職能素養 1(Competency 1): 知識整合 Knowledge Integration			職能素養 3(Competency 3): 研究能力 Research Skills	
課程類別 Course Attributes	☐ 人文關懷課程(Humanities Caring) ☐ 競賽專題課程(Competition) ☐ 問題導向課程(Problem-solving) ☐ 專題導向課程(Project-based) ☐ 實作課程(Practice-based) ☐ 總整課程(Capstone)			
教材編選 Teaching materials	■自製簡報(self-made PPTs) ☐ 課程講義(Teaching Notes) ■自編教科書(self-made textbooks) ☐ 教學程式(programming)			

	☐ 自製教學影片(self-made video) ☐ 其他(Others)			
教學資源 Teaching Resources	☐ 課程網站(Website) ☐ 實習網站(Intern Web) ☐ 教材電子檔供下載(Downloadable Files)			
教科書/參考書 Textbooks/References	Main materials: • Teacher-developed lecture notes and slides, distributed section by section. Reference books (optional, for additional reading): • Björk, T., Arbitrage Theory in Continuous Time, Oxford. • Shreve, S. E., Stochastic Calculus for Finance, I–II, Springer. • Duffie, D., Dynamic Asset Pricing Theory, Princeton.			
評量方式(請填百分比) Assessment	課堂參與 Participation	10%	個案討論 Case study	%
	作業 Homework	0%	專題 Project	30%
	小考 Quiz	0%	其他 1 other ()	%
	期中考 Midterm	30%	其他 2 other ()	%
	期末考 Final	0%	其他 3 other ()	%
	報告 Presentation	30%	其他 4 other ()	%
其他說明 Other description	Papers for the paper presentations (Weeks 12–13) and the final report: ● Broadie, M., Chernov, M., & Johannes, M. (2009). Understanding index option returns. <i>The Review of Financial Studies</i> , 22(11), 4493–4529. ● Coval, J. D., & Shumway, T. (2001). Expected option returns. <i>The Journal of Finance</i> , 56(3), 983–1009. ● Goyal, A., & Saretto, A. (2009). Cross-section of option returns and volatility. <i>Journal of Financial Economics</i> , 94(2), 310–326. ● Zhan, X., Han, B., Cao, J., & Tong, Q. (2022). Option return predictability. <i>The Review of Financial Studies</i> , 35(3), 1394–1442. ● Bali, T. G., Chabi-Yo, F., & Murray, S. (2022). A factor model for stock returns based on option prices. <i>SSRN 3487947</i> . ● Neuhierl, A., Tang, X., Varneskov, R. T., & Zhou, G. (2026). Do option characteristics predict the underlying stock returns in the cross-section?. <i>Management Science</i> , 72(4), 2742–2760. ● Kelly, B. T., Kuznetsov, B., Malamud, S., & Xu, T. A. (2023). Deep learning from implied volatility surfaces. <i>Swiss Finance Institute Research Paper</i> , (23–60).			

課程規劃表 Course Schedule

週次 week	日期 Date	內容 Description	教材章節 Textbook	其他說明 Remark
1.	9/7	Introduction to Financial Engineering; Arbitrage and the Logic of Pricing		
2.	9/14	Information, Martingales, and Multi-Period Markets		
3.	9/21	Brownian Motion and Itô Calculus		
4.	9/28	教師節（放假）		
5.	10/5	Brownian Motion and Itô Calculus		
6.	10/12	The Black–Scholes World		
7.	10/19	Computational Methods		
8.	10/26	光復節（放假）		
9.	11/2	Midterm Exam		
10.	11/9	Implied Volatility and the Smile		
11.	11/16	Beyond Black–Scholes		
12.	11/23	Paper Presentation I		
13.	11/30	Paper Presentation II		
14.	12/7	Volatility Derivatives		
15.	12/14	Invited Speech		
16.	12/21	Final Report		
17.				
18.				