

 國立東華大學
教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	經濟數學			學年/學期 Academic Year/Semester	115/1
課程名稱(英文) Course Name in English	Mathematics in Economics				
科目代碼 Course Code	EC__D0280	系級 Department & Year	博士	開課單位 Course-Offering Department	經濟學系
修別 Type	選修 Elective	學分數/時間 Credit(s)/Hour(s)		1.0/1.0	
授課教師 Instructor	/林晏如				
先修課程 Prerequisite					
課程描述 Course Description					
This six-week intensive course introduces the fundamental mathematical tools commonly used in economic analysis and is designed to provide students with the quantitative foundation needed for subsequent courses in microeconomics, macroeconomics, and other advanced fields of economics. The course emphasizes the economic applications and intuitive interpretation of mathematical methods. Economic models and examples are used throughout to illustrate how these tools can be applied to equilibrium analysis, comparative statics, and optimization problems. The course covers the basic concepts and operations of matrices and vectors, determinants, inverse matrices, Cramer’ s Rule, and the application of systems of linear equations to economic models. Building on these foundations, the course introduces comparative statics and explains how changes in exogenous variables or parameters affect the equilibrium values of endogenous variables. The analysis is then extended to multivariable functions and nonlinear economic models through the use of the Jacobian matrix and its applications to comparative statics. Finally, the course introduces optimization methods commonly used in economics, including unconstrained and constrained optimization, enabling students to analyze basic decision problems faced by consumers, firms, and other economic agents. Upon completion of the course, students should be able to understand and apply matrices, vectors, determinants, inverse matrices, and Cramer’ s Rule to solve basic economic models; use comparative statics and Jacobian methods to analyze how parameter changes affect economic equilibrium; and apply basic optimization techniques to economic problems. The course is intended to equip students with the mathematical skills necessary to read, understand, and analyze quantitative economic models.					
課程目標 Course Objectives					
The course covers the mathematical structures commonly found in economics. It provides the basic mathematical background needed in quantitative economic analysis. The main focus of the course is the study of optimization theory and its applications to economics.					
系專業能力 Basic Learning Outcomes					課程目標與系專業能力相關性 Correlation between Course Objectives and Dept.’ s Education Objectives
A	數理分析能力：通曉經濟學的高階理論技巧，應用數學與賽局解決經濟議題的能力 Mathematical analysis skills: Mastering in advanced application of mathematical theories and game theory in analyzing economic issues				●
B	實證經濟分析能力：通曉經濟學的高階實證技巧，善用資訊科技進行資訊蒐集、資料統計與計量分析。 Empirical analysis skills: Mastering in advanced application of statistics and econometrics in data collection and examination				●

C	微觀經濟之闡釋能力：通曉高階個體經濟學相關的理論與應用Microeconomic perspective: Thorough understanding of advanced microeconomic theories and relevant application	
D	宏觀經濟之闡釋能力：通曉高階總體經濟學相關的理論與應用Macroeconomic perspective: Thorough understanding of advanced macroeconomic theories and relevant application	
E	自我調整適應社會之能力：具備適應現代社會的學養以及就業能力。Employment opportunities: capabilities of working on important policy and decision challenges in business and government	
F	溝通表達能力：思路清晰，有能力與人溝通並撰寫高階專業研究報告Communication skills: Having a clear mind and profound ability in presenting advanced professional academic research	

圖示說明Illustration：● 高度相關 Highly correlated ○ 中度相關 Moderately correlated

授課進度表 Teaching Schedule & Content

週次Week	內容 Subject/Topics	備註Remarks
1	Matrices and Vectors	
2	Determinants, Inverse Matrices, and Cramer' s Rule	
3	Comparative Statics and Jacobian	
4	Nonlinear Comparative Statics and the Implicit Function Theorem	
5	Optimization	
6	Final Exam	
7		
8		
9	期中考試週 Midterm Exam	
10		
11		
12		
13		
14		
15		
16		
17	期末考試週 Final Exam	

彈性 教學 規劃 Flexible Teaching Plan	請勾選(至少需勾選1 個項目): Please tick the box(es). (At least one item is required.):
	☐ 問題討論 Problem-based Discussion
	☐ 翻轉教學 Flipped Classroom
	☐ 展演實作 Performance / Practical Presentation
	☐ 校外參訪 Off-campus Visit
	☐ 講座活動 Lecture / Seminar
	☐ 線上作業 Online Assignments
	☒ 自主學習 Self-directed Learning
	☐ 課業輔導 Academic Support
	☐ 實驗操作 Experiment Operation
	☐ 遠距教學(同步) Distance Learning (Synchronous)
	☐ 遠距教學(非同步) Distance Learning (Asynchronous)
☐ 其他(請填寫) Others (Please specify.):	
備註: 本校學期週數自115 學年度起調整為17 週, 為符合1學分18 小時之原則, 請教師規劃安排彈性教學。 Note: From the 115th academic year, the semester will be 17 weeks. Please include flexible teaching activities to meet the required 18 hours per credit.	

教 學 策 略 Teaching Strategies

- ☒ 課堂講授 Lecture
 ☐ 分組討論 Group Discussion
 ☐ 參觀實習 Field Trip
☐ 其他 Miscellaneous:

教 學 創 新 自 評 Teaching Self-Evaluation

創新教學(Innovative Teaching)

- ☒ 問題導向學習(PBL)
 ☐ 團體合作學習(TBL)
 ☐ 解決導向學習(SBL)
☐ 翻轉教室 Flipped Classroom
 ☐ 磨課師 Moocs

社會責任(Social Responsibility)

- ☐ 在地實踐 Community Practice
 ☐ 產學合作 Industry-Academia Cooperation

跨域合作(Transdisciplinary Projects)

- ☐ 跨界教學 Transdisciplinary Teaching
 ☐ 跨院系教學 Inter-collegiate Teaching

- ☐ 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

學期成績計算及多元評量方式 Grading & Assessments									
配分項目 Items	配分比例 Percentage	多元評量方式 Assessments							
		測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
平時成績(含出缺席) General Performance (Attendance Record)	30%								
期中考成績 Midterm Exam									
期末考成績 Final Exam	40%								
作業成績 Homework and/or Assignments	30%								
其他 Miscellaneous (_____)									
評量方式補充說明 Grading & Assessments Supplemental instructions Mainly based on the supplementary explanations provided by the instructor during the first week of class.									
教科書與參考書目(書名、作者、書局、代理商、說明) Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.) Course materials prepared by the instructor Fundamental Methods of Mathematical Economics; Author: Chiang									
課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址) Teaching Aids & Teacher's Website(Including online teaching information. Personal website can be listed here.)									
其他補充說明 (Supplemental instructions)									