Lahore University of Management Sciences

ECON 262 – Mathematical Applications in Economics

SUMMER 2023-24

Instructor	Usman Elahi
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Office Hours	
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Course URL (if any)	

Course Teaching Methodology (Please mention following details in plain text)
We will have on campus classes for this course

Course Basics				
Credit Hours	4			
Lecture(s)	Nbr of Lec(s) Per Week	4	Duration	120 min
Recitation/Lab (per week)	Nbr of Lec(s) Per Week		Duration	
Tutorial (per week)	Nbr of Lec(s) Per Week		Duration	

Course Distribution	
Core	None
Elective	Elective
Open for Student Category	All
Close for Student Category	None

COURSE DESCRIPTION
Mathematics serves as a fundamental component of modern economic analysis. As such, it is essential for Economists to be familiar with the various mathematical representations and techniques used in the field of Economics. This course provides an introduction to the mathematical methods and their applications relevant to economics literature.

COURSE PREREQUISITE(S)	
•	Calculus I
•	Principles of Microeconomics

COURSE OBJECTIVES	
•	Introduce students to the fundamental mathematical methods used in current Economic Literature

Learning Outcomes

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•	Students should develop the ability to understand and use mathematical techniques used in Economics

Grading Breakup and Policy
Quiz(s): 45% (4-5 Quizzes) Short Assignments: 15% Final Examination: 40%

Examination Detail	
Midterm Exam	Yes/No: No Combine Separate: Duration: Exam Specifications:
Final Exam	Yes/No: Yes Combine Separate: Separate Duration: 2-3 hours Exam Specifications: Closed books and notes, help sheet not allowed, calculator usage allowed

COURSE OVERVIEW

Module	Topics	Recommended Readings	Objectives/ Application
1	**Introduction and Overview: Introduction, Notation, Economic Models**	**Chiang Ch 1,2** **Simon and Blume Ch 1**	**Brief Overview of Notation to be used in the course.**
2	**Linear Algebra: Vectors, Properties of Matrices, Matrix Algebra**	**Chiang Ch 3,4,5** **Simon and Blume Ch 6,7,8,9,10,11**	**Concepts of equilibrium, Linear Equations and Matrix Algebra**
3	**Calculus: Single variable and Multivariable Concepts including derivatives, graphs etc.**	**Chiang Ch 6,7,8** **Simon and Blume Ch 2,3,4,5,13,14,15**	**Review of Single Variable calculus and extension of concepts to Multiple Variables.**
4	**Static Optimisation: Unconstrained and Constrained Optimisation for single multiple variables**	**Chiang Ch 9,11,12,13** **Simon and Blume Ch 16,17,18,19,20,21,22**	**Tools for solving optimisation problems over multiple variables.**
5	**Dynamic Optimisation: Difference Equations, Differential Equations, Optimal Control**	**Chiang Ch 14,15,16,17,18,19,20** **Simon and Blume Ch 23,24,25**	**Application of Differential and Difference Equations. Optimisation over time.**

Textbook(s)/Supplementary Readings
Alpha C. Chiang and Kevin Wainwright. Fundamental Methods of Mathematical Economics. 4th Edition. Tata McGraw Hill Higher Education. 2013 Carl P. Simon and Lawrence Blume, Mathematics for Economists; W W Norton, 1994.