



ECO 251 Mathematics in Economic Analysis

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

This course discusses a great variety of topics related to mathematical economics. It is designed to acquaint students with the critical mathematics in economic analysis. Topics involved in this course will include optimization in firm and consumer behaviour, effects of a constraint, Lagrange multipliers, utility maximization, matrix algebra, etc. These tools are widely used in modern micro-founded macroeconomics, interdependent economies, industrial economics, public economics, labour economics, environmental economics, international economics and finance.

Upon Completion of this Course, students will be able to:

1. Transforming a research question into a mathematical model suitable for analysis;
2. Applying the tools to economic models to obtain model predictions;
3. Writing coherent and logically sound proofs, fluency with mathematical notation, formulating appropriate (counter)-examples to evaluate conjectures;
4. Obtain communication skills in order to critique, create and communicate understanding.

PREREQUISITES

N/A

GRADING

Grades will be determined by accumulating points, with 100 points being the



maximum, as follows:

ITEM	POINTS
4 Assignments	40 Points
Midterm Exam	25 Points
Final Exam	35 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

Alpha C. Chiang, Kevin Wainwright, *Fundamental Methods of Mathematical Economics, 4th Edition*, McGraw-Hill, 2005.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	<p>Topics: Topic 1: Course introduction Topic 2: Optimization: a special variety of equilibrium analysis Topic 3: Optimum values and extreme values Topic 4: Exponential and Logarithmic Functions</p> <p>Assessments: Assignment#1</p>
Module 2	<p>Topics: Topic 5: Optimization with Equality Constraints Topic 6: Effects of a Constraint Topic 7: Finding the Stationary Values Topic 8: Second-Order Conditions</p> <p>Assessments:</p>



	Assignment#2
Module 3	<p>Topics: Topic 9: Utility Maximization and Consumer Demand Topic 10: Homogeneous Functions Topic 11: Least-Cost Combination of Inputs Topic 12: Nonlinear Programming and Kuhn-Tucker Conditions</p> <p>Assessments: Assignment#3 Midterm Exam</p>
Module 4	<p>Topics: Topic 13: The Constraint Qualification Lagrange multipliers Topic 14: Matrix Algebra Topic 15: Matrices and Vectors Topic 16: Matrix Operations</p> <p>Assessments: Assignment#4</p>
Module 5	<p>Topics: Topic 17: Identity Matrices and Null Matrices Topic 18: Conditions for Nonsingularity of a Matrix Topic 19: Finding the Inverse Matrix Application to Market and National-Income Models Topic 20: Final exam reviews</p> <p>Assessments: Final Exam</p>

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share



with fellow colleagues.

LEARNING REQUIREMENTS

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACADEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.



蘇州大學
Soochow University

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.