# ECO 210 Mathematical Economics

## Summer 2023

**Course Credits:** 4
**Contact Hours:** 55 hours
**Instructor:** TBA
**Email:**TBA

## COURSE OBJECTIVES

This course provides an introduction of the mathematical techniques to help students fully learn about mathematical economics through examples of their application to economics. The mathematical techniques covered in this course are relevant to microeconomics, macroeconomics and business economics. Topics include equilibrium analysis, linear models, matrix algebra, optimization of functions and their applications, economic analysis and integral calculus and so on.

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

1. Use and explain the underlying principles, terminology, methods, techniques and conventions used in the subject;
2. Solve economic problems using the mathematical methods described in the subject;
3. Understand the relationship between discounting in discrete time and discounting in continuous time;
4. Master equilibrium analysis and matrix algebra;
5. Model economic questions as mathematical problems.

## PREREQUISITES

ECO 110 Microeconomics; ECO 120 Macroeconomics

## GRADING

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

maximum, as follows:

| ITEM | POINTS |
|---|---|
| Assignments | 20 Points |
| Quizzes | 20 Points |
| Midterm | 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 and Kevin Wainwright, ***Fundamental Methods of Mathematical Economics***, 4th Edition, McGraw Hill Higher Education Press. 2005.

**Recommended (Optional) Texts or Other Materials:**

None

## COURSE TOPICS

| MODULE | TASKS |
|---|---|
| Module 1 | **Topics:**<br>Topic 1: Course Introduction<br>Topic 2: Equilibrium analysis in economics<br>Topic 3: Linear models and matrix algebra<br>Topic 4: Comparative Statics<br>**Assessments:**<br>Assignment#1 |

| | |
|---|---|
| Module 2 | **Topics:**<br>Topic 5: Differentiation<br>Topic 6: Optimization of functions one variable<br>Topic 7: Optimization of functions one variable(Cont.)<br>Topic 8: Optimization of functions of more than one variable<br>**Assessments:**<br>Quiz#1 |
| Module 3 | **Topics:**<br>Topic 9: Optimization of functions of more than one variable(Cont.)<br>Topic 10: Lagrange-multiplier method<br>Topic 11: First-derivative or second order conditions<br>Topic 12: Introduction to mathematics<br>**Assessments:**<br>Midterm<br>Assignment#2 |
| Module 4 | **Topics:**<br>Topic 13: Uncertainty and consumption under capital markets imperfections<br>Topic 14: Uncertainty and consumption under capital markets imperfections(Cont.)<br>Topic 15: Multiple agents' optimization<br>Topic 16: Economic Analysis and Integral Calculus<br>**Assessments:**<br>Quiz#2 |
| Module 5 | **Topics:**<br>Topic 17: Economic Analysis and Integral Calculus(Cont.)<br>Topic 18: First Order Difference Equations<br>Topic 19: First Order Difference Equations(Cont.)<br>Topic 20: Final Exam Reviews<br>**Assessments:**<br>Final Exam |

## 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).

## ACEDEMIC 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.

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.