

# Syllabus

## Fall, 2021

### Course Information

Course Number: ECMT 660/ECON 460  
Course Title: Mathematical Economics  
Section: 600/500  
Time: TR 1:05 pm–2:20 pm  
Location: HECC 200  
Credit Hours: 3

### Instructor Details

**Instructor:** Professor Guoqiang Tian  
**Office:** LASB 256  
**Phone:** 845-7393  
**E-Mail:** gtian@tamu.edu  
**Office Hours:** TR 4:00-5:00 pm or by appointment (on line only)  
**Link:** <https://tamu.zoom.us/j/362-397-3071>  
**Password: 123456**

**Teaching Assistant:** Mr. Jinliang Liu  
**Office:** LASB 260  
**Phone:** 919-564-8271  
**E-Mail:** jl716@tamu.edu  
**Office Hours:** W 12pm-2pm  
**Link:** <https://tamu.zoom.us/j/97786206079>

### Course Description

The purpose of this course is to introduce basic mathematical methods (solution techniques) used in the three major types of economic analysis: equilibrium analysis; comparative statics; and optimization methods, which correspond to Parts 2-4 in the textbook, respectively. These mathematical topics are subjects in linear algebra (matrix algebra), mathematical analysis, and optimization theory. The mathematical methods covered in this course are fundamental since they are indispensable for a proper understanding of modern economics and they provide basic mathematical tools needed in many fields related to economics and business sciences as well as for your future studies.

### Course Prerequisites

MATH 131/141 (or MATH 151/152)

## Special Course Designation

This is a stacked course for both graduate and undergraduate students. Students taking ECMT 660 are required to study additional material in each major topic area that is not required for students taking ECON 460. In addition, students taking ECON 460 are not competing against students taking ECMT 660. Grades will be assigned for those taking ECON 460 separately from those taking ECMT 660.

## Course Learning Outcomes

Through learning about the basic mathematical methods (solution techniques) introduced in this course, students are expected to have a mastery of the fundamentals indispensable for a proper understanding of modern economics and grasp the basic mathematical tools needed in many economics and business-related fields.

## Textbook and/or Resource Materials

**The textbook** is *Fundamental Methods of Mathematical Economics* by Chiang, A. and Kevin Wainwright, fourth edition, New York: McGraw-Hill Book Company, 2004. The lectures, however, will be mainly based on my lectures notes *Mathematical Economics*, which can be downloaded from Canvas and my website at: [http://people.tamu.edu/~gtian/teaching\\_and\\_class\\_materials.html](http://people.tamu.edu/~gtian/teaching_and_class_materials.html)

## Grading Policy

You will be evaluated on the basis of **seven** homework assignments, **two** 75-minute tests and **the final exam**. Homework will be handed out periodically. Learning by doing is essential for studying well. Working on the questions in these problem sets can help you understand the Text materials significantly. You are encouraged to form study groups to work on these homework assignments. Each study group is up to three students and hands in only **one copy** for each assignment. You are also strongly suggested to study the questions in Exercises in the textbook for preparing your tests and exam.

Your grade will be calculated using the method listed below:

Homework:	20%
Test 1:	20%
Test 2:	20%
Final exam:	40%

Overall total point is 100. The grade distribution is as follows:

**Graduate student:** having point between 90-100, 80-89, 70-79, 60-69, or 0-59 will receive a grade A, B, C, D, or F, respectively.

**Undergraduate student:** having point between 85-100, 75-84, 65-74, 55-64, or 0-54 will receive a grade A, B, C, D, or F, respectively.

## Late Work Policy

Late work and missed exams will be governed by university rules on university-excused absences (See *Student Rule 7*: <https://student-rules.tamu.edu/rule07/>).

## Tentative Course Schedule

### Part I. Equilibrium Analysis and Linear Algebra

1. The Nature of Mathematical Economics (Chapter 1): Week 1
2. Equilibrium Analysis in Economics (Chapter 3): Week 1
3. Linear Models and Matrix Algebra (Chapter 4): Week 2
4. Linear Models and Matrix Algebra Continued (Chapter 5): Week 3-4

**Due Date of Homework 1 (for Chapter 3-4): Thursday, September 16**

**Due Date of Homework 2 (for Chapter 5): Thursday, September 30**

**Test 1: Thursday, October 7 1:05 pm–2:20 pm**

### Part II. Comparative-Static Analysis and Mathematical Analysis

5. Comparative Statics and the Concept of Derivative (Chapter 6): Week 4-5
6. Rules of Differentiation and Their Use in Comparative Statics (Chapter 7): Week 5, Week 7
7. Comparative-Static Analysis of General Function Models (Chapter 8): Week 8

**Due Date of Homework 3 (for Chapter 6-7): Thursday, October 21**

**Due Date of Homework 4 (for Chapter 8): Thursday, October 28**

**Test 2: Thursday, November 4 1:05 pm–2:20 pm**

### Part III. Optimization Theory

8. Optimization: One Choice Variable (Chapter 9): Week 9-10
9. Exponential and Logarithmic Functions (Chapter 10): Week 11
10. Optimization: More Than One Choice Variable (Chapter 11): Week 12-13
11. Optimization with Equality Constraints (Chapter 12): Week 13-14
12. Optimization with Inequality Constraints (Chapter 13): Week 15

**Due Date of Homework 5 (for Chapter 9-10): Thursday, November 11**

**Due Date of Homework 6 (for Chapter 11): Tuesday, November 23**

**Due Date of Homework 7 (for Chapter 12): Thursday December 2**

**Final Exam: Wednesday, December 15, 8:00-10:00 am**

## University Policies

### Attendance Policy

All students in the course are **required** to attend class, take all homework assignments and exams. Class attendance will be checked regularly.

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

### Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" ([Student Rule 7, Section 7.4.1](#)).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See [Student Rule 24](#).)

### Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" ([Section 20.1.2.3, Student Rule 20](#)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at [aggiehonor.tamu.edu](http://aggiehonor.tamu.edu).

## Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit [disability.tamu.edu](http://disability.tamu.edu). Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

## Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](#)):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, you will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with [Counseling and Psychological Services](#) (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's [Title IX webpage](#).

## Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in proper self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to

8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at [suicidepreventionlifeline.org](https://www.suicidepreventionlifeline.org).

## The Value of Vaccinations and Masking

**To help protect Aggieland and stop the spread of COVID-19, Texas A&M University urges students to be vaccinated and to wear masks in classrooms and all other academic facilities on campus, including labs. Doing so exemplifies the Aggie Core Values of respect, leadership, integrity, and selfless service by putting community concerns above individual preferences. COVID-19 vaccines and masking — regardless of vaccination status — have been shown to be safe and effective at reducing spread to others, infection, hospitalization, and death.**