

Course Outline

EE320: INTRODUCTORY MATHEMATICAL ECONOMICS (SECTION 046401)

Semester 2/2024

Lecture Time: Tuesday, 09.00-12.00 hours

Lecture Venue: Room 302

Teaching Materials Platform: MS Team

Instructor: Anin Aroonruengsawat, Ph.D.

Office: Main administrative office on the 5th floor.

Office Hours: By appointment.

Email: anin[at]econ.tu.ac.th

Number of Credit: 3 Credits (3-0-6)

Prerequisite: a) EE211, EE212 and MA216 (or MA211) OR

b) EE213, EE214 and MA 216 (or MA 211)

(Credits will not be awarded to students who are taking or have completed EE421)

Course Description:

Applying mathematical concepts and tools such as functions, equations, matrices, univariate and multivariate differential calculus, constrained and unconstrained optimization and integral to explain concepts of microeconomic and macroeconomic theory and to understand the relationship between different economic variables. An emphasis will be placed on relationships between total, average, and marginal functions, the analyses of elasticity, market equilibrium, impacts of taxation, and the basic input-output model.

Course Objectives:

1. To equip students with essential mathematical concepts and tools in studying economics.
2. To expose students to the application of mathematical concepts in analyzing economic problems.

Main Text:

Anin Aroonruengsawat (2024) "Lecture on introductory mathematical economics"
(To be posted on MS-Teams)

Chiang, A. C. and Wainwright, K. (2005) *Fundamental Methods of Mathematical Economics*, 4th edition, McGraw-Hill, Inc., Singapore.

Expected learning outcomes and Class learning outcomes

<i>Catergories</i>	<i>Expected Learning Outcome (Applicable)</i>	<i>CLOs</i>	<i>Teaching Methods</i>	<i>Assesment methods</i>
<i>Knowledge</i>	K1. Demonstrate the ability to analyze and solve problems using economic theories and tools, and apply this knowledge effectively in practical work.	CLO 1- CLO5	Lecture / Workshop	Exams/Quizzes
<i>Skills</i>	S1. Select and apply economic principles, tools, and methods appropriately to solve economic and social challenges.	CLO 1- CLO5	Lecture / Workshop	Exams/Quizzes
	S3 Use digital tools for data collection, statistical analysis methods, and presentation.	CLO 1- CLO5		
<i>Ethics</i>	E1. Uphold academic integrity and respect academic freedom	CLO5	Lecture / Workshop	Observed Class participation
	E3. Recognize the ethical dimensions of economic decision- making and policy design, particularly in relation to social impacts, resource distribution, and sustainability, with a focus on social responsibility.	CLO5	Lecture / Workshop	Observed Class participation
<i>Character</i>	C2. Demonstrate a commitment to lifelong learning, creative thinking, openness to diverse perspectives, systematic planning, and continuous self-improvement.	CLO 1- CLO5	Lecture / Workshop	Observed Class participation

Teaching schedules:

Session	Date		Month	Topics	Details	Note / Activity
1	21	Tue	Jan	Overview	- Course overview & Logistics information - Mathematical Economics Models: why and what for?	
2	28	Tue	Jan	Equilibrium model I	- Equilibrium model - Solution method for system of equations - Micro-market equilibrium model: Basic Analysis and Some extensions - Multi-market equilibrium model	
3	4	Tue	Feb	Equilibrium model II	- Macroeconomics model - Keynesian cross, IS-LM, AD-AS model - Non-linear model	
4	11	Tue	Feb	Matrix algebra I	- Algebraic operation of matrix - Determinant - Inversion	
5	18	Tue	Feb	Matrix algebra II	- Matrix method to the solution of system of equations - Economics Applications	
6	25	Tue	Feb	Calculus I	- Derivative: Methods and interpretation - Characteristics of function by derivatives - Differential and Approximation - Extreme points problem: Conditions and solution methods	Quiz 1 – Equilibrium model and Matrix algebra No makeup quiz will be given.
7	4	Tue	Mar	Calculus II	- Extreme points problem: Conditions and solution	

Session	Date		Month	Topics	Details	Note / Activity
					methods (contd.) - Economics Applications	
Midterm Exam / Feb, Tuesday 11th 2025 (12.00-14.00: 2 hours) – closed book exam; collects 30%						
8	18	Tue	Mar	Multivariate Calculus I	- Methods of multivariate differentiation - Economics applications	
9	25	Tue	Mar	Multivariate Calculus II	- Characteristic of function by multivariate differentiation	
10	1	Tue	Apr	Unconstrained optimization I	- General theory: Conditions and solution methods - Economics Applications	Quiz 2 – Multivariate Calculus and unconstrained optimization No makeup quiz will be given.
11	8	Tue	Apr	Unconstrained optimization II	- Economics Applications	
Songkran break: no class (Apr 13 – Apr 16)						
12	22	Tue	Apr	Constrained optimization I	- General theory: Conditions and solution methods - Economics applications	
13	29	Tue	Apr	Constrained optimization II	- Economics applications	
14	6	Tue	May	Integration: I	- Methods & Economics applications	Quiz 3 – Constrained optimization No makeup quiz will be given.
15	13	Tue	May	Integration II Review session	- Economics application - Review questions	
Final exam / May, Wednesday 28th 2025 (13.30-16.30: 3 hours) – closed book exam; collect 50%						

Note: Instructor reserves the right to adjust teaching schedule as needed.

Assessments:

Types of assessment methods	Weight	Note
Quiz	20%	<ul style="list-style-type: none">• 3 Quizzes will be given.• All quizzes are scheduled in advance. Check the quiz date from the teaching schedule above. No makeup quiz will be given.
Midterm exam	30%	Tuesday 11th February 2025 (12.00-14.00: 2 hours)
Final exam	50%	Wednesday 28th May 2025 (13.30-16.30: 3 hours)

Grading Criteria:

We have two sections in this semester. 50% of the exam will be the same in both sections. Grading will be determined separately. To determine the letter grade, I use the distribution-based method. There is no fixed threshold of grade F. However, those with scores lower than 40 out of 100 are very likely to get an F.

My Class, My Rules: You MUST READ the following rules:

1. **During the exams, questions are not allowed.** Understanding the questions is part of the exam. If there are errors on my exam, I will adjust the scores in a way that is beneficial to everyone.
2. There are **no make-up quizzes or exams** unless you have seriously unavoidable reasons. A family vacation is not one of them.
3. I do not take attendance. If you choose not to attend classes, it is **your full responsibility to keep up with lectures** and any announcements made during class.
4. If you decide to come to class, you should respect your friends and me by not chatting or answering your phone. If you do not comply, a warning will be given. **Three counts of disruption will result in a deduction of 5 points** from your total score.
5. MS Teams is a platform for posting announcements and class materials. It is **NOT a platform for reaching me 24/7 to answer your questions on demand**, especially during the exam period.
6. **Questions related to class materials MUST be asked during lectures, after class, or during office hours.**
7. I am aware that some of you are using private tutoring services instead of attending my lectures. Developing the ability to learn independently is an essential skill for undergraduate students. **You should NOT rely solely on tutoring.**

8. Frequently Asked Questions:

1. *How many questions will be on the exam?*
 - It does not matter.
2. *Can I bring cheat sheet to the exam?*
 - No
3. *I got XX on the mid-term; will I get at least a B in this class?*
 - I don't know. It totally depends on your relatively performance in this class. A good midterm score does not guarantee a good final grade, and a bad midterm score does not necessarily mean a bad final grade.
4. *Can I do extra work to earn more points?*
 - No.

ACADEMIC CALENDAR & HOLIDAY SEMESTER 2/2024

Semester 2/2024 (January 20 – May 14, 2025)	
Create Plan from Quota via TU Greats App <i>(*ID.64 – 67)</i>	December 13 – 20, 2024
Registration via TU Greats App <i>(*ID.64 – 67)</i>	December 16 – 20, 2024
Tuition Fee Payment Period (Via TU Greats App) <i>(*ID.64 – 67)</i>	December 16, 2024 – January 17, 2025
Classes Begin	January 20, 2025
Add-drop period	January 20 – February 2, 2025 <i>(from 9.00 AM of January 20 to 10.30 PM of February 2).</i>
Tuition Fee Payment Period (Via TU Greats App)	January 20 – February 3, 2025 <i>(9 AM - 10.30 PM)</i>
<i>Makha Bucha Day *</i>	<i>February 12, 2025</i>
Mid-term Examination Period	March 9 – 16, 2025
Withdrawal period with "W" on record	February 3 – March 30, 2025 <i>(from 9.00 AM of February 3 to 10.30 PM of March 30).</i>
Special Withdrawal with "w" on record	March 31 – 2 May, 2025
<i>Substitution for Chakri Memorial Day*</i>	<i>April 7, 2025</i>
<i>Songkran Festival Day*</i>	<i>April 13 – 16, 2025</i>
Last day of class for Semester 2/2024	May 14, 2025
<i>Substitution for Visakha Bucha Day*</i>	<i>May 12, 2025</i>
Final exam period	May 16 - 30, 2025
Submitting Forms for Degree Conferral	January 20 – February 2, 2025

Remark * Holiday, No classes during this period

Updated: October 17, 2024