



Course Outline

EE320: INTRODUCTORY MATHEMATICAL ECONOMICS (SECTION 046402)

Semester 2/2025 (January 5 - May 2, 2026)

Number of Credit: 3 credits

Prerequisite: a) EE 211, EE 212 and MA 216 (or MA211) or
b) EE 213, EE 214 and MA216 (or MA 211)

Information about Instructor:

- **Name:** Kittichai Saelee, Asst. Prof.
- **Lecture classroom:** Room 204, Econ-TPC bldg.
- **Office:** Rm#517 Econ-TPC bldg.
- **Office Hours:** By appointments only.
- **Email:** kittichai_lee[at]econ.tu.ac.th

Class Time and Logistic

Class day: Thursday

Class time: 09.00 AM – 12.00 PM

LMS: Google classroom, by invitation to students' email (@st.econ.tu.ac.th)

Venue: Room 204, 2nd floor, Faculty of Economics

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 Learning Outcomes:

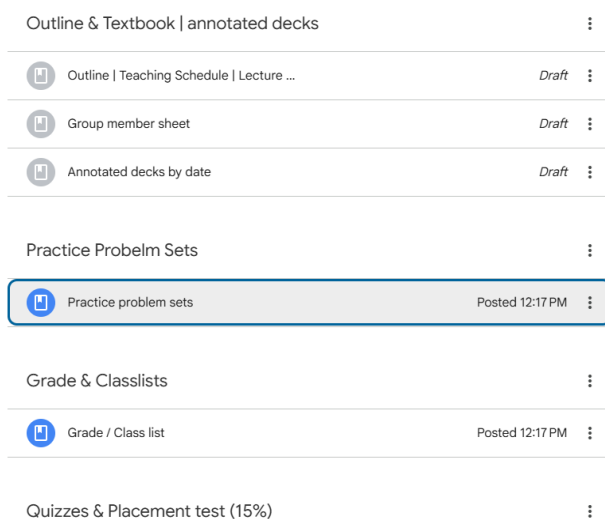
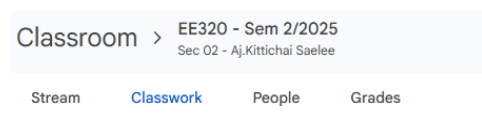
- **CLO1:** Demonstrate a solid understanding of fundamental mathematical concepts, including functions, equations, matrices, differential calculus, and optimization, and explain their applications in economic theory.
- **CLO2:** Apply mathematical techniques such as differential calculus and optimization to analyze and solve economic problems in both microeconomic and macroeconomic contexts.
- **CLO3:** Analyze key economic phenomena, including market equilibrium, elasticity, and the effects of taxation, using mathematical models, and interpret their real-world implications.
- **CLO4:** Construct and apply mathematical models, including basic micro- market and Keynesian IS-LM models, to predict economic outcomes and assess the impact of various economic policies and scenarios.
- **CLO5:** Evaluate the ethical considerations of economic decisions, such as taxation and market interventions, and demonstrate a responsible approach to applying mathematical analysis for the benefit of society.

Main Text:

Kittichai Saelee (**KS**: 2025) "Lecture on introductory mathematical economics" (To be posted on Google classroom)

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

Note: All online resources/materials are posted on the Google classroom. Check the classwork tab and the sub-section there.



Program Learning Outcomes (Applicable to EE320):

<i>Categories</i>	<i>Program Learning Outcome (Applicable)</i>	<i>CLOs</i>	<i>Teaching Methods</i>	<i>Assesment methods</i>
<i>Knowledge</i>	K1 Acquiring knowledge and understanding of economic theories, fundamental economic tools, theory development, and applied economics K2 Ability to apply theoretical knowledge to analyze and provide practical suggestions for economic and social issues K4 Ability to attain lifelong learning and thoroughly understand world economic and societal changes and impacts	CLO 1 - CLO5	Lecture / Workshop	Exans / Quizzes
<i>Skills</i>	S1 Acquiring intellectual skill and ability to think systematically to identify research topics, perform research, process data, and evaluate findings S2 Acquire analytical and communication skills and ability to interpret data from different sources, analyze, and integrate knowledge to propose appropriate problem-solving guidelines for economic and social issues S3 Acquire quantitative and technological skills for research studies	CLO 1 - CLO5	Lecture / Workshop	Exans / Quizzes

<i>Categories</i>	<i>Program Learning Outcome (Applicable)</i>	<i>CLOs</i>	<i>Teaching Methods</i>	<i>Assesment methods</i>
<i>Ethics</i>	E1 Acknowledge moral values and exhibit ethical traits, including decency, selflessness, and integrity E3 Respect rights, opinions, values, and dignity of others. Obey organizational and societal rules and regulations	CLO5	Lecture / Workshop	Exans / Quizzes
<i>Character</i>	C1 Ability to effectively complete assigned tasks and responsibilities C2 Ability to initiate problem analysis independently and/or in teamwork C4 Show active learning characteristics and aspire to personal development	CLO 1 - CLO5	Lecture / Workshop	Exans / Quizzes

Learning Assessment Plan:

CLO	Methods of Learning Assessment	Assessment Week	Proportion of Assessment
CLO1	Develop lectures, case Examples, class discussions, and evaluations that ensure the fulfillment of course's CLOs and PLOs.	4 Quizzes (approximately given every 4 weeks) 2 - 3 Random Quizzes (once a month) Midterm Exam (Week 8th) Final Exam (Week 16th)	Pre-informed Quizzes = 12% Random Quizzes = 3% Midterm Exam 35% Final Exam 50%
CLO2			
CLO3			
CLO4			
CLO5			

Teaching schedules:

Session	Topics	Details
1	Overview & Equilibrium model I	- Course overview & Logistics information - Mathematical Economics Models: why and what for? - Structure of mathematical economics model - Review concept on mathematical functions - Types of commonly used functions
2	Equilibrium model II	- Equilibrium model - Solution method for system of equations - Micro-market equilibrium model: Basic Analysis and Some extensions - Multi-market equilibrium model
3	Equilibrium model III	- Macroeconomics model - Keynesian cross, IS-LM, AD-AS model - Non-linear model
4	Matrix algebra I	- Algebraic operation of matrix - Determinant - Inversion
5	Matrix algebra II	- Matrix method to the solution of system of equations - Economics Applications
6	Calculus I	- Derivative: Methods and interpretation - Characteristics of function by derivatives - Differential and Approximation - Extreme points problem: Conditions and solution methods
7	Calculus II	- Extreme points problem: Conditions and solution methods (contd.) - Economics Applications
Midterm Exam: Tuesday, February 24, 2026 12.00-14.00 hrs.		
8	Multivariate Calculus I	- Methods of multivariate differentiation - Partial derivative / Total differentials / Total derivative / Partial total derivative - Some economics applications
9	Multivariate Calculus II	- Implicit function Theorem - Characteristic of function by multivariate differentiation
10	Unconstrained optimization I	- General theory: Conditions and solution methods - Economics Applications
11	Unconstrained optimization II	- Economics Applications
12	Constrained optimization I	- General theory: Conditions and solution methods - Economics applications
13	Constrained optimization II	- Economics applications
14	Integration I	- Methods & Economics applications
15	Integration II Review session	- Economics application - Review questions
Final Exam: Thursday, May 14, 2026 09.00-12.00 hrs.		

Note:

- Instructor reserves the right to adjust teaching schedule as needed.

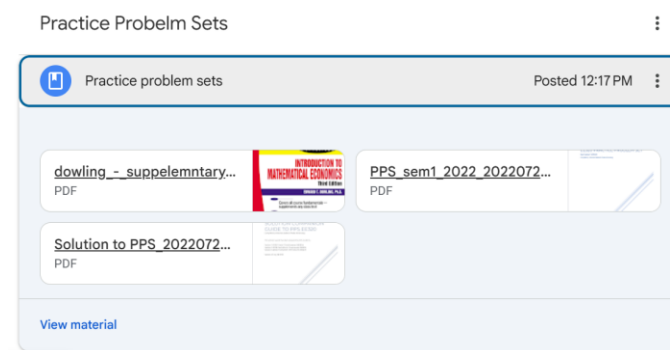
Assessments:

Types of assessment methods	Weight	Note
Pre-informed Quizzes*	12%	4 Quizzes will be given. The best THREE will be selected; I will drop the lowest one out. - All quizzes are informed one week in advance, between 11:45 and 12:15. No makeup quiz will be given.
Random in-Class quizzes*	3%	2-3 random quizzes, given. All counts. No makeup quiz will be given.
Midterm exam	35%	Tuesday, February 24, 2026 12.00-14.00 hrs. See the exam policy below.
Final exam	50%	Thursday, May 14, 2026 09.00-12.00 hrs. See the exam policy below.

* Paper will be provided. No writing supplies will be provided, so please bring your own pen or pencil.

Note:

- All materials will be posted under classwork tab. Check the sub-section there for useful resources.
- Practice problems for each topic will be posted on the class website. Students are encouraged to practice these exercises by themselves regularly.



- Guideline for midterm and final exams:
 - Accommodation for students with verified medical conditions will be made according to the University's and Faculty's policies. For privacy purposes and record tracking, please contact B.E. office by email. Your request will be reviewed by the program's officer.
 - Students who intend to miss either of the exams or have other plans on either of the planned exam dates should make a request for a rescheduled exam or accommodation with the B.E. office in advance. However, please keep in mind that your request for a rescheduled exam or accommodation will be granted in only a few reasonable cases. (Please note that personal travel plans do not qualify for exam postponement.) In any case, plan ahead of time and contact B.E. office as early as possible. The review process takes some time.
 - Students who miss the exam due to an emergency or unforeseen circumstance should contact the B.E. office as soon as possible. You may file the request to schedule a makeup exam. Your request will be reviewed by B.E. office.

Grading Criteria:

We have two sections in this semester. **Grading will be determined separately.** To determine the letter grade, I use **a mixed procedure between the criteria-based and the distribution-based method.** When the

criteria-based grading can be directly applied, I follow the general guideline of the university described below.
In any case, I reserve the right to adjust the grading criteria as I see fit.

A = 4.0 (85-100) B+ = 3.5 (75-84) B = 3.0 (70-74) C + = 2.5 (65-69)

C = 2.0 (60-64) D+ = 1.5 (50-59) D = 1.0 (40-49) F = 0 (0-39)

Note: When your letter grade is posted in the Reg-TU, you can file the request for a grade reconsideration. For the purpose of record tracking, contact B.E. office and fill out the request form. BE office will review your request and proceed with their steps.



ACADEMIC CALENDAR & HOLIDAY SEMESTER 2/2025

Semester 2/2025 (January 5 - May 2, 2026)	
Enrollment by import quota (Confirm quota Via REG TU) (*ID.65 – 68)	December 1 – 4, 2025
Tuition Fee Payment Period (Via TU Greats App) (*ID.65 – 67)	December 1, 2025 – January 2, 2026
Classes Begin	January 5, 2026
Add-drop period (Via REG TU) (All *ID)	January 5 – 18, 2026 <i>(from 9.00 AM of January 5 to 10.30 PM of January 18)</i>
Tuition Fee Payment Period (Via TU Greats App) (For Students who add-drop courses) (All *ID)	January 5 – 19, 2026 <i>(from 9.00 AM of January 5 to 10.30 PM of January 19)</i>
Withdrawal period with "W" on record	January 19 – March 15, 2026 <i>(from 9.00 AM of January 19 to 10.30 PM of March 15)</i>
Mid-term Examination Period	February 22 – 28, 2026
<i>Makha Bucha Day *</i>	<i>March 3, 2026</i>
Special Withdrawal with "W" on record	March 16 – April 20, 2026
<i>King Rama I Memorial and Chakri Day*</i>	<i>April 6, 2026</i>
<i>Songkran Festival Day*</i>	<i>April 13 – 18, 2026</i>
Last day of class for Semester 2/2025	May 2, 2026
<i>Royal Ploughing Ceremony*</i>	<i>May 11, 2026</i>
Final exam period	May 5 – 19, 2026
Submitting Forms for Degree Conferral (ID.64-65)	January 5 – 18, 2026

Remark * Holiday, No classes during this period
Updated: October 22, 2025