Course Outline

EE320: INTRODUCTORY MATHEMATICAL ECONOMICS (SECTION 046401)

Semester 1/2024 (Aug 13th – Dec 2th , 2024)

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)

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.

Instructor:

Name: Kittichai Saelee

Lecture classroom: Room 303, Econ-TPC bldg.

Office: Rm#517 Econ-TPC bldg.

Office Hours: By appointment.

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

Class Time and Logistic	
Class day:	Tuesday
Class time:	09.00 AM – 12.00 PM
LMS:	Google classroom, by invitation to students' email (@st.econ.tu.ac.th)
Venue:	Room 303, 3rd floor, Faculty of Economics

Main Text:

Kittichai Saelee (KS: 2024) "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**)

Expected Learning Outcomes:

1. **Morality and Ethics**

Applicability	Learning Goals
●	1.1 Students demonstrate integrity.
□	1.2 Students prioritize social and public benefits over personal ones.
●	1.3 Students are punctual and comply with the code of conduct of the institution and society at large.
□	1.4 Students are responsible and accountable to society, the nation, and the subject of economics.
□	1.5 Students realize the cultural and environmental value of the sustainable society.

2. **Knowledge**

Applicability	Learning Goals
●	2.1 Students know and understand modern economics principles and theories, and are up to date with new developments.
●	2.2 Students know and understand Thai and global economic structure, and the importance of major international economic events.
●	2.3 Students know and understand instruments of economic analysis.
●	2.4 Students know and understand applied fields in economics, including monetary, public, international, business, natural resource and environmental, industrial, agricultural, cooperative, political,

	developmental, and entrepreneurial economics as well as agribusiness.
□	2.5 Students are informed about related fields including sociology, business administration, education, law policy, and science.

3. Intellectual Development

Applicability	Learning Goals
●	3.1 Students have developed individual critical thinking.
●	3.2 Students are sufficiently trained in research skills.
●	3.3 Students demonstrate an ability to analyze and synthesize data, as well as appropriately integrate economics concepts to understand causes of current economic problems in Thailand. Based on analysis and synthesis, students demonstrate an ability to propose policy guidelines to resolve problems.

4. Interpersonal Skills and Responsibilities

Applicability	Learning Goals
●	4.1 Students are responsible for assigned tasks and work in groups effectively.
●	4.2 Students have problem-solving skills.
□	4.3 Students show leadership skills and team spirit.
●	4.4 Students are always improving themselves.
□	4.5 Students have good interpersonal skills, adapting and working under different conditions.

5. Quantitative Analysis, Communication and Information Technology

Applicability	Learning Goals
●	5.1 Students select and apply appropriate statistical and mathematical methods for data processing, interpretation, conclusions, and recommendations to resolve problems.
□	5.2 Students communicate effectively and select appropriate presentation methods.
●	5.3 Students use information and communication technologies appropriately to gather data as well as process, interpret, and present results.

Teaching schedules:

Session	Date		Month	Topics	Details	Note / Activity
1	13	Tue	Aug	Overview & Equilibrium model I	- Course overview & Logistics information - Mathematical Economics Models: why and what for? - Review concept on mathematical functions - Types of commonly used functions	
2	20	Tue		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	27	Tue		Equilibrium model III	- Macroeconomics model - Keynesian cross, IS-LM, AD-AS model - Non-linear model	
4	3	Tue	Sept	Matrix algebgra I	- Algebraic operation of matrix - Determinant - Inversion	
5	10	Tue		Matrix algebra II	- Matrix method to the solution of system of equations - Economics Applications	
6	17	Tue		Calculus I	- Derivative: Methods and interpretation - Characteristics of function by derivatives - Differential and Approximation - Extreme points problem: Conditions and solution methods	
7	24	Tue		Calculus II	- Extreme points problem: Conditions and solution methods (contd.) - Economics Applications	
	Midterm Exam / **Oct, Tuesday 1st 2024 (12.00-14.00: 2 hours)** - closed book exam; collects 35%					

Session	Date		Month	Topics	Details	Note / Activity
8	8	Tue	Oct	Multivariate Calculus I	- Methods of multivariate differentiation - Partial derivative / Total differentials / Total derivative / Partial total derivative - Some economics applications	
9	15	Tue		Multivariate Calculus II	- Implicit function Theorem - Characteristic of function by multivariate differentiation	
10	22	Tue		Unconstrained optimization I	- General theory: Conditions and solution methods - Economics Applications	
11	29	Tue		Unconstrained optimization II	- Economics Applications	
12	5	Tue	Nov	Constrained optimization I	- General theory: Conditions and solution methods - Economics applications	
13	12	Tue		Constrained optimization II	- Economics applications	
14	19	Tue		Integration: I	- Methods & Economics applications	
15	26	Tue		Integration II Review session	- Economics application - Review questions	
	Final exam / **Dec, Saturday 7th 2024 (09.00-12.00: 3 hours)** - closed book exam; collect 45%					

Note:

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

Assessments:

Types of assessment methods	Weight	Note
Quiz	**12%**	● 5 Quizzes will be given. **The best four will be selected; the lowest one will drop out.** ● All quizzes will be informed at least one week in advance. **No makeup quiz will be given.**
Group assignments	**8%**	● 4 Group assignments. **All count.** ● All group assignments will be informed at least one week in advance. ● You must have **at least 3 students** in your group. The number is capped at the **maximum of 5 students**. ● Select a member in your team as the group leader. Group leader will **submit the ID lists of your group members by Aug 24th.** Use the following links -> https://shorturl.at/RWHrP ● The group leader will also be responsible for uploading the answer file to Google classroom. Discuss with all group members before submitting the name list. ● To submit your group homework, upload the answer file **(in .pdf only)** to Google classroom. The required format of your filename is *group_x_hw_y* when x is your group number, and y is the assignment number. **If you do not follow this instruction, your marking score will be deducted by 50%.** ● **As usual, no late homework will be accepted.**
Midterm exam	**35%**	Scheduled on Oct, Tuesday 1st 2024 (12.00-14.00: 2 hours. See the exam policy below
Final exam	**45%**	Dec, Saturday 7th 2024 (09.00-12.00: 3 hours) See the exam policy below.

Note:

1. Practice problems for each topic will be posted on the class website. Students are encouraged to practice these exercises by themselves regularly.
2. Guideline for midterm and final exams:
   - Accommodations 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 accommodations with the B.E. office in advance. However, please keep in mind that your request for a rescheduled exam or accommodations 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.

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 1/2024

Semester 1/2024 (August 13 – December 2, 2024)	
Create Plan from Quota via TU Greats App (*ID.64 – 66)	July 9 – 11, 2024
Registration via TU Greats App (*ID.64 – 66) Tuition Fee Payment Period (Via TU Greats App) (*ID.64 – 66)	July 9 – 11, 2024 July 9 – August 9, 2024
Classes Begin	August 13, 2024
Add-drop period	August 13 – 26, 2024 *(from 9.00 AM of August 13 to 10.30 PM of August 26)*
Tuition Fee Payment Period (Via TU Greats App) *(All *ID)*	August 13 – 27, 2024 *(9 AM - 10.30 PM)*
Mid-term Examination Period	September 29 – 30, October 1 – 6, 2024
*Substitution for H.M. King Bhumibol Adulyadej The Great Memorial Day**	*October 14, 2024*
*King Chulalongkorn's Day**	*October 23, 2024*
Withdrawal period with "W" on record	August 29 – October 20, 2024 *(from 9.00 AM of August 29 to 10.30 PM of October 20)*
Special Withdrawal with "w" on record	October 21 – November 20, 2024
Last day of class for Semester 1/2024	December 2, 2024
Final exam period	December 3-4, 6-9, 11-19, 2024
*H.M. King Bhumibol Adulyadej The Great's Birthday**	*December 5, 2024*
*Constitution Day**	*December 10, 2024*
Submitting Forms for Degree Conferral	August 13 – 26, 2024

Remark * Holiday, No classes during this period
Updated: June 14, 2024