



Course Syllabus
EE 376 Economics of Climate Change
Semester 2/2025 (January 5 – May 2, 2026)

Lecture Time: Monday, 9:00-12:00
Lecture Venue Room 203, Faculty of Economics
Teaching Materials Platform: Facebook Group “EE376 2025-2”
<https://www.facebook.com/groups/883563487475490>

Instructor: **Name:** Assoc. Prof. Chayun Tantivasadakarn
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Office: Room # 8 the 60th Anniversary Building
Office hour: Monday, 13:00 – 14:30

Number of credits: 3 credits
Prerequisites: EE 210 or EE 211 or EE 213

Course Description:

Basic concepts of climate change relating to environmental economics, efficiency, externalities, and policy instruments. The role of economics in the formation of climate policy. Economic problems of climate change, such as intertemporal decisions, impacts of climate change, cost of mitigation, and adaptation. Thailand and international cooperation and debate in climate policy.

Course Objectives:

Students will be equipped with the basic principle of climate change science and its linkages and impacts to the economy including the economic knowledge and analytical skills to assess the economic implications of climate change, evaluate policy options for climate mitigation and adaptation.

Expected Learning Outcomes
1. Morality and Ethics EE376

Applicability	Expected Learning Outcomes	Evaluation Method
●	1. Students demonstrate integrity.	Quizzes and assignments
●	2. Students prioritize social and public benefits over personal ones.	

●	3. Students are punctual and comply with the code of conduct of the institution and society at large.	
●	4. Students are responsible and accountable to society, the nation, and the subject of economics.	
●	5. Students realize the cultural and environmental value of a sustainable society.	

2. Knowledge

Applicability	Expected Learning Outcomes	Evaluation Method
●	1. Students know and understand modern economics principles and theories, and are up to date with new developments.	Quizzes, assignments, and exam
●	2. Students know and understand Thai and global economic structure and the importance of major international economic events.	
○	3. Students know and understand the instruments of economic analysis.	
●	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.	
●	5. Students are informed about related fields including sociology, business administration, education, law policy, and science.	

3. Intellectual Development

Applicability	Expected Learning Outcomes	Evaluation Method
●	1. Students have developed individual critical thinking.	Group project
●	2. Students are sufficiently trained in research skills.	
●	3. Students demonstrate an ability to analyze and synthesize data, as well as appropriately integrate economics	

	concepts to understand the causes of current economic problems in Thailand. Based on analysis and synthesis, students demonstrate an ability to propose policy guidelines to resolve problems.	
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4. Interpersonal Skills and Responsibilities

Applicability	Expected Learning Outcomes	Evaluation Method
●	1. Students are responsible for assigned tasks and work in groups effectively.	Group project
●	2. Students have problem-solving skills.	
○	3. Students show leadership skills and team spirit.	
●	4. Students are always improving themselves.	
○	5. Students have good interpersonal skills, adapt, and work under different conditions.	

5. Quantitative Analysis, communication, and information technology

Applicability	Expected Learning Outcomes	Evaluation Method
○	1. Students select and apply appropriate statistical and mathematical methods for data processing, interpretation, conclusions, and recommendations to resolve problems.	Assignments
○	2. Students communicate effectively and select appropriate presentation methods.	Group project
○	3. Students use information and communication technologies appropriately to gather data as well as process, interpret, and present results.	

Remark: ● Primary expected outcome ○ Secondary expected

Learning Management and Evaluation

CLO	Learning Management	Evaluation	PLOs
C1. Understand the basic principle of climate change science related to greenhouse gas emissions and their	Lectures and readings from IPCC's documents	Exercises, homeworks, and exams	K1, K3, K4, E1-E3

impacts on the environment and the economy			
C2. Apply the concepts of market failure to analyze how they lead to climate change	Lectures with economic graphs and calculations to demonstrate with examples	Excercises, homeworks, and exams	K1-K4, E1-E3
C3. Understand the concept of carbon pricing as a tool to mitigate greenhouse gas emissions and be able to compare its pros and cons as well as the impacts of differences in carbon pricing levels on international trade and investment issues	Lectures with economic graphs and calculations to demonstrate with empirical studies	Excercises, homework, and exams	K1-K4, E1-E3
C4. Understand the usage of carbon labeling and nudge to enhance sustatinalbe consumption choices	Lectures with economic graphs and calculations to demonstrate with examples	Excercises, homeworks, and exams	K1-K4, E1-E3
C5. Analyze and evaluate vareities of mitigation measures to achieve global desirable temperature	Apply EN-ROADS Climate Solution Simulator	Assignments	S1, S2, E2
C6. Understand the role of global climate-change institutions and important regulations of climate agreements and their economic and social consequences	Lectures with examples and case studies	Exams	K1, K3, K4, E1-E3
C7. Understand the concept of adaptation economics and project evaluation tools	Lectures with examples and case studies		
C8. Construct an infographic poster to using data and information with proper visualization and citation, presenting sharp arguments linking	Student group project with oral presentation to the class	Peers and instructor evaluations, and	K1-K4, S1, S2, E1-E3,

the topic with the economics of climate change mitigation and/or adaptation, cost-effectiveness evaluation when applicable, attractive and reader-friendly poster design		Facebook's likes and shares	C1, C2, C4
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Learning Assessment Plan

CLO	Methods of Learning Assessment	Assessment Week	Proportion of Assessment
C1. Climate science	Excercise 1, exam	2nd	Midterm Exam 35% Final Examination 35% Exercises&Assignments 15% Poster 15%
C2 Market failure	Excercise 2, exam	4th	
C3 Carbon pricing	Excercise 3, exams	6th	
C4 EN-ROADS Simulator	Assignment 1, exam	8th	
C5 Sustainable consumer choices	Assignment 2, exam	10th	
C6 Global Climate Institution	Final Exam		
C7 Economics of Adaptation	Final Exam		
C8 Infographic Poster and Presentation	Poster	14th and 15th	

Reading lists

- [T] Tantivasadakarn, Chayun (2019) Economics of Climate Change (in Thai), Thammasat University Press.
- [FF] Field, B., & Field, M. (2017). *Environmental economics: An introduction* (Seventh ed.). New York, NY: McGraw-Hill Education.
- Grubb, M. (2004). "Technology Innovation and Climate Change Policy: an overview of issues and options." *Keio Economic Studies*, 41(2): 103-132.
- Goulder, L.H., and S.H. Schneider (1999) 'Induced Technological Change and the Attractiveness of CO₂ Abatement Policies,' *Resource and Energy Economics*, Vol. 21, pp. 211-53.
- [HR] Harris, J. M., & Roach, B. (2017). *Environmental and natural resource economics: A contemporary approach*. Routledge.
- [H] Houghton, John (2004) *Global Warming: The Completer Briefing*, 3rd edition, Cambridge University Press.
<http://www.gci.org.uk/Documents/Global-Warming-the-Complete-Briefing.pdf>
- [Incropera] Incropera, F. P. (2016). *Climate change: a wicked problem: complexity and uncertainty at the intersection of science, economics, politics, and human behavior*. Cambridge University Press. (ห้องสมุดปริทัศน์)
- IPCC (2013a) Summary for Policymakers. In: *Climate Change 2013: The Physical Science Basis*. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)].

- Milton, E.J., and Euston Quah (2023) Cost-Benefit Analysis, Routledge.
- Nordhaus, W. D. (2007). A review of the Stern review on the economics of climate change. *Journal of economic literature*, 45(3), 686-702.
- [Nordhaus] Nordhaus, W. D. (2013). *The climate casino: Risk, uncertainty, and economics for a warming world*. Yale University Press.
- Pearce, David (1991), "The Role of Carbon Taxes in Adjusting to Global Warming," *The Economic Journal*, Vol. 101, No. 407, (Jul., 1991), pp. 938-948.
- [Stern] Stern, N., & Stern, N. H. (2007). *The economics of climate change: the Stern review*. Cambridge University press.
- [TT] Tietenberg, T. H., & Lewis, L. (2016). *Environmental and natural resource economics*. Routledge.

Additional links:

Glossary terms: https://archive.ipcc.ch/pdf/special-reports/srex/SREX-Annex_Glossary.pdf

Gas Emissions by Countries and Sectors: <https://www.wri.org/blog/2020/02/greenhouse-gas-emissions-by-country-sector>

Global emission: <https://www.c2es.org/content/international-emissions/>

NASA: <https://climate.nasa.gov/evidence/>

Lecture Schedule

Date	Topics
1	1. Introduction to Climate Change Science - The Earth's climate system - Greenhouse gas (GHGs), global energy balance, and the greenhouse effect
Jan 5, 2026	- Important GHGs: CO₂ and carbon cycles, other GHGs - Dissenting opinions: the great hoax? Reading: H Ch. 1-4, T Ch. 1, Nordhaus Ch.5, 13-14, 24-25, Incropera Ch. 2-6, 9.
2	2. Anthropogenic global warming and consequences - GHGs concentration and global temperature - Impacts, damages and losses of CC
Jan 12, 2026	- GHGs data and information - GHGs emission by countries - Share of mitigation responsibility for climate stability Reading: H Ch. 6-7, Incropera Ch. 5, T Ch. 2, IPCC (2013a), Stern Ch. 3-6 Exercise 1: topic #1 and #2
3	3. Climate Change and Market Failure - Externalities and carbon pricing - Global commons and Tragedy of Commons - The under provisioning of Public Goods
Jan 19, 2026	Reading: HR Ch. 3-4, T Ch. 3

Date	Topics
4	4. Carbon Taxes • Optimum emission • Correction market failure with carbon ◦ Single source ◦ Multiple sources • Pros and cons of carbon taxes • Carbon tax research Reading: HR Ch. 16, T Ch. 4, Pearce, David (1991) pp. 938-948. Exercise 2: topic #3
Jan 26, 2026	
5	5. Carbon Market or Cap-and-Trade • Definition and concept of Carbon market • Demand and supply of carbon credits ◦ Deriving the demand and supply for carbon credits ◦ Factors influencing the demand and supply ◦ Carbon market equilibrium • Choices of carbon credits allocation and efficiency • Comparison of carbon market and carbon tax • Carbon market research Reading: HR Ch. 16, T Ch. 5
Feb 2, 2026	
6	6. Carbon pricing and international competitiveness • Theoretical background • Economic impacts of ETS • Economic impacts of carbon tax • Competitiveness impacts Reading: Tantivasadakarn, Chayun; “Carbon Pricing and International Competitiveness for Thailand and ASEAN,” Thammasat Review of Economic and Social Policy, Vol. 6, No. 2, July-December, 2020. Exercise 3: topic #5 - 6
Feb 9 2026	
7	7. Climate change, International Trade, and Investment • Carbon offshoring and Carbon leakages • Concepts about GHGs responsibility ◦ Production-based and consumption-based responsibility Reading: Incropera Ch. 8, T Ch. 8-9
Feb 16, 2026	
	Midterm: Monday, February 23, 2026 09.00-11.00 hrs.
8	8. Carbon Border Adjustment Mechanism • Border-Carbon Adjustment (BCAs) or Carbon-Border-Adjustment Measures (CBAM) • proponent and opponent views • EU’s Carbon Border Adjustment Measure Assignment 1: En-Roads model
Mar 2, 2026	

Date	Topics
9	9. Sustainable consumer choices 9.1 Carbon Labeling - Life cycle assessment (LCA) - What is carbon labelling? - Economics of carbon labelling - Types of carbon labelling - Carbon labelling situation in other countries and Thailand 9.2 Behavioral Economics and climate mitigation - Concept of nudge - Applications
Mar 9, 2026	
10	9. Global Institutions: Kyoto Protocol and Post-Kyoto - The Intergovernmental Panel on Climate Change (IPCC) - The United Nations Framework Convention on Climate Change (UNFCCC) - Kyoto Protocol - Paris Agreement Reading: Incropera Ch. 8, T Ch. 5 Assignment 2: topic# 9.1
Mar 16, 2026	
11-12	10. Economics of Climate Change Adaptation - Climate risks - Climate change adaptation - Cost-Benefit Analysis (CBA) concept - Social discount rates Reading: FF Ch.6 Stern Ch. 5,6, 9, 12, 18-20, Nordhaus Ch.15-16, 18
Mar 23, Mar 30, 2026	
13-14	11. Group project presentation (9:00-12:00, 13:00-16:00)
Mar 27, 2026	
	Final exam: Tuesday, May 5, 2026 13.30-16.30 hrs.

Evaluation

Midterm Examination	35%
Final Examination	35%
Exercises and Assignments	15%
Poster and presentation	15%

Infographic Poster and Presentation (15 points):

- Design and print an **A0-sized academic poster** linking climate change issue with a selected topic from the following list. A poster may have a free-style title, but must be

informative and comprehensive in its content, and contain some constructive arguments in the analytical part.

Suggested topic lists:

EV battery technology	Mass transit system	Early Warning Systems and Climate Monitoring	Nature-based adaptation
Concentrating solar power	Climate-smart agriculture	Circular economy	Funding climate technology
Biomass energy	Green Hydrogen	Water management	Food waste management
Bio fuel	Plant-based meat	Flood management	Forest management
Small Modular Nuclear Reactor	Coral reef restoration technology	Solid waste management	Renewable energy and grid stability
Small wind turbine energy	Urban Planning and Green Infrastructure	Waste water management	Climate Justice and Equity Issues
Carbon Capture and Storage (CCS)	Low carbon tourism	Climate-related health issues	Data Centers and AI impacts on climate change

Evaluation will be based on the ability to arrange data and information with proper visualization and citation, presenting sharp arguments (concise and interesting leading questions and the existing conflicts of viewpoint relevant to the chosen topic) linking the topic with **the economics of climate change mitigation and/or adaptation**, cost-effectiveness evaluation when applicable, and an attractive and reader-friendly poster design. The total mark will come from instructor evaluation (7 marks), peer evaluation (4 marks), and Facebook like and share (4 marks)

Your oral presentation would take 12 minutes (without any notes!) and 3 minutes of Q&A.

Submission date of selected topic: Mar 9, 2026

Submission date of the outline: Mar 23, 2026

Presentation dates: Apr 20, 2026

Note: Please be strictly aware of the ‘*plagiarism rule*’ which could bring a zero score for violators.

CONTACT INFORMATION

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