

**UNIVERSITY OF MADRAS**  
**M.A. DEGREE PROGRAMME IN ECONOMICS**  
**SYLLABUS WITH EFFECT FROM 2023-2024**

**401E2D**

**SEMESTER- II - ELECTIVE – IV (2)**  
**ECONOMICS OF CLIMATE CHANGE**

**Course Objectives**

1. The objective of this course is to analyses climate change from an economic perspective.
2. The problem is characterized as one of regulating a global stock externality in an intertemporal setting and in the presence of uncertainty and irreversibility.

**Unit I:Introduction**

Science of climate change; global and regional climate predictions; uncertainty in science; physical impacts of climate change – agriculture, sea level rise, health, extreme events; policy debate.

**Unit II:Climate Change Policy - Mitigation**

Efficiency, public goods, externalities; environmental policy instruments – emissions trading, carbon tax, emission trading versus tax; stock pollutants and discounting; decisions under risk and uncertainty;

**Unit III:Integrated Assessment**

Costs and benefits of greenhouse gas mitigation; integrated assessment models; simulation exercises based on DICE model and its variants; sensitivity and uncertainty analysis; Stern review.

**Unit IV:Climate Change Policy - Adaptation**

Climate change impact assessment – applications for agriculture, sea level rise and health; vulnerability assessment; economics of adaptation; measurement of adaptation cost; issues in financing adaptation.

**Unit V:Climate Change Negotiations and Equity**

Criteria for distribution of emission reduction burden; distribution criteria for adaptation fund; inter and intra-generational equity issues; discounting in climate change context

**Text Books:**

1. Perman, R., Ma. Y., Common, M., Maddison, D., Mcgilvray, J., Natural Resource and Environmental Economics, Pearson Education Limited, 2011 (4th Edition).
2. Intergovernmental Panel on Climate Change – Fifth Assessment Report, 2011 Stern, N., The economics of climate change – The Stern Review, Cambridge University Press, 2006.

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**Reference:**

1. F. Ackerman, E. Stanton: Climate Economics: State of the Art. Routledge (2013)
2. W. Nordhaus: A Question of Balance. Yale University Press (2008)
3. D. Acemoglu, P. Aghion, Leonardo Bursztyn, D Hemous. (2012). “The environment and directed technical change,” American Economic Review, 102(1): 131-166.

**Web Resources:**

1. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjc>
2. <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjc->

**Course Outcomes (Cos):**

Upon Completion of this course, the students will be able to

CO Code	Course Outcomes	K-Levels
CO1	To define and explain the science of climate change.	K1, K2
CO2	To explain and identify the climate change policy.	K2, K3
CO3	To illustrate and analyses the integrated assessment of climate changes.	K2, K4
CO4	To classify, compare and evaluate climate change impact assessment.	K4, K5
CO5	To estimate and illustrate the climate change negotiations and equity.	K5, K6

K<sub>1</sub> – Knowledge, K<sub>2</sub> - Understand, K<sub>3</sub> – Apply, K<sub>4</sub> – Analyse, K<sub>5</sub> – Evaluate, K<sub>6</sub> – Create.

**CO-PO Mapping (Course Articulation Matrix)**

CO /PO	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3
CO2	3	3	3	3	3	3
CO3	3	3	3	3	3	3
CO4	3	3	3	3	3	2
CO5	3	3	3	3	3	3
Weightage	15	15	15	15	15	15
Weighted percentage of Course Contribution to Pos	3.0	3.0	3.0	3.0	3.0	3.0

**Level of Correlation between PSO’s and CO’s**

(Suggested by UGC as per Six Sigma Tool – Cause and Effect Matrix)

Assign the value

**1 – Low**

**2 – Medium**

**3 – High**

**0 – No Correlation**