**上海交通大学硕士研究生课程教学大纲**

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| 课程基本信息（Course Information） |
| 课程代码（Course Code） | EU26009 | \*学时（Credit Hours） | 32 | \*学分（Credits） | 2 |
| \*课程名称（Course Name） | （中文）碳经济学 |
| （英文）Carbon Economics |
| 课程性质(Course Type) | 专业前沿课 Discipline Frontier Courses |
| 授课语言(Language of Instruction) | English |
| \*开课院系（School） | China-UK Low Carbon College |
| 先修课程（Prerequisite） | Environmental Economics |
| 授课教师（Teacher） | Haishan YuHaitao Yin | 课程网址(Course Webpage) |  |
| \*课程简介（Description） |  本课程是为低碳学院学生开设的专业前沿课，课程建立在对环境经济学有基本了解的基础上，用经济学的方法和视角来分析气候变化应对和适应中的问题。课程分概述、理论和专题三个部分。首先，对气候变化问题，包括其科学事实、成因、影响、以及科学研究中的不确定性进行简要介绍；其次，对气候变化经济学的基本内容以及其区别于一般环境经济学的特点进行概述。理论部分主要介绍气候变化的减缓、适应以及气候变化问题的成本效益分析。专题部分涵盖气候变化经济学里的几个重要问题，包括中国的气候政策、气候国际谈判、可再生能源等。 |
| \*课程简介（Description） |  The course is built upon a basic knowledge of environmental economics, and studies issues specific to climate change. We will start with a brief introduction of science of climate change to better understand how important uncertainty is. It then moves to a brief introduction to climate change economics and clarify what makes it different from traditional environmental economics. We will then talk about climate change mitigation from both policy and technique perspective, and climate change adaptation which involves taking action so that we can be more resilient to our current climate. The cost-benefit analysis will be introduced with focus on integrated assessment model and the concept of social cost of carbon. We will also briefly talk about climate policies in China. We will then move to some trending topics at present, the international climate negotiation and renewable energy. |
| 课程教学大纲（course syllabus） |
| \*学习目标(Learning Outcomes) | The primary aim of this course is to provide participants with a well-founded understanding of the important insights provided by economic analysis into climate change mitigation, and adaptation.On completion of the course, students will have gained insight into:* Basic science of climate change
* Economic models and theories relevant to climate change
* Important policy instruments to address climate change
* The Key elements in the Cost-and-Benefit Analysis of climate change
* Difficulties of reaching an effective international agreement to mitigate climate change
* The importance of renewable energy in tackling climate change

Based on the above knowledge, students should be able to give a presentation and/or written report on the economic implications of climate change at the global, regional or local scale. Students should have an understanding of key economic principles that enables them to engage, in an intelligent and informed way, with the growing number of economists and economics literature concerned with climate change. |
| \*教学内容、进度安排及要求(Class Schedule& Requirements) |

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| Lecture 1 | Introduction to the Science and Economics of Climate Change I | Introduction to the course and the science of climate change |
| Lecture 2 | Introduction to the Science and Economics of Climate Change II | Impacts of climate change and economic analysis of climate change  |
| Lecture 3 | Climate Change Mitigation | Policy perspective (tax, cap-and-trade), technical aspects  |
| Lecture 4 | Climate Change Adaptation | IPCC AR5 |
| Lecture 5 | Cost-Benefit Analysis in Climate Change | IAMs, SCC etc. |
| Lecture 6 | Climate Policy in China |  |
| Lecture 7 | The international climate negotiation |  |
| Lecture 8 | Renewable Energy I |  |
| Lecture 9 | Renewable Energy II |  |
| Lecture 10 | Group Presentation |  |
| Lecture 11 | Final Exam |  |

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| \*考核方式(Grading) | * Attendance (10%).
* Assignment 1 and 2 (30%).
* Written examination (60%).
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| \*教材或参考资料(Textbooks & Other Materials) | This course is NOT a textbook course. The lectures are built upon a series of materials including chapters from selected books, academic papers, reports and other materials relevant to the course. The essential reading list will be handed out before the course kicks off. Additional readings will be given in advance of respective lecture. Most of the materials should be possibly accessed from university library either hardcopy or electronic version.  |
| 其它（More） |  |
| 备注（Notes） |  |

备注说明：

1.课程大纲一般为教师网上填写，填写要求会自动提示；对于新开课程，需要填着纸质大纲，并经院系教学委员会或专业委员会通过。

2．带\*内容为必填项。

3．课程简介字数为300-500字；课程大纲以表述清楚教学安排为宜，字数不限。

**Assignment:**

Assignment 1 (10%): Climate trends (Due in the weekend of Week 2)

Go to <http://www.ncdc.noaa.gov/cag/time-series>

• Select Statewide

• Select Parameter: choose “Average Temperature”, you can re-do this several times to get something interesting.

• Select Time Scale: 12-Month

• Select Month: May

• Select Start Year: 1985

• Select End Year: 2015

• Select State/Region: any US state you prefer

• In gray box: Unclick Display Base Period

• In gray box: Click Display Trend AND Per Century AND Smoothed Time Series

BEFORE you click “Plot”, make a guess about which direction you expect the trend to be (Bear in your mind where the state you choose is located).

• Click Plot. You will see the chart according to your choice of parameters.

Now, you can save the chart and submit.

• Right Click the chart, then select “Save Current Graph as PNG image”.

• Name the file as LastnameFirstnameUSLocalClimate.png (e.g., YuHaishanUSLocalClimate.png).

• Submit your file.

I will assemble them into slides for class in week 3.

Assignment 2: Group project (20%)

Groups should choose one of the countries/regions to present. Students will be assigned into groups at the beginning of the course. And the country lists will be given at the same time. Each group is required to focus on a specific industry or sector in the country they choose to produce an independent and in-depth report on the economics of climate change impacts, adaptation, and mitigation. The report is expected to cover: the current state of affairs, with respect to expected climate change impact, and an economic assessment of adaptation and mitigation options. The detailed instructions of the report will be given in the early lectures.

**Readings:**

There are no required books for the course but there are many readings for each session, though most are brief. Class depends on active student participation so, please, do the readings before class.

There are some suggested books to provide students with a good background of the subject. We may cover some chapters from the suggested books in the course but not all of them. For the chapters that are covered they will appear in the reading list.

**Suggested Books:**

Congressional Budget Office (2003)**, “The Economics of Climate Change: a Primer”**

[**https://www.cbo.gov/sites/default/files/108th-congress-2003-2004/reports/04-25-climatechange.pdf**](https://www.cbo.gov/sites/default/files/108th-congress-2003-2004/reports/04-25-climatechange.pdf) **(retrieved on July 4th, 2018)**

The book is published more than a decade ago. Some scientific evidence and analyses are outdated. Nevertheless, the book provides a clear framework for climate change economics, and is a good start to learn about the subject.

Eggleton, R.A.**, A short introduction to climate change. Cambridge University Press. 2013.**

The e-book version can be accessed by

<https://www.cambridge.org/core/books/short-introduction-to-climate-change/F19CE3E933D038C27CD2B9365CF1D870> (You may need university VPN to access the ebook or access the ebook within campus network.)

Nordhaus, W., 2013. **The Climate Casino**. New Haven; London: Yale University Press.

Wagner G. and Weitzman M., 2015. **Climate Shock: the Economic Consequences of A Hotter Planet**. Princeton University Press.

**Tentative Reading List**

(Below is the preliminary essential reading list which may be subject to changes before the course. There will be another additional and further reading lists handed out during the course. Don’t be daunted by large number of readings: total pages per class session is rather small.)

**Lecture 1 Introduction to the Science of Climate Change**

IPCC, 2013. **Climate Change 2013: The Physical Science Basis. Contribution of**

 **Working Group I to the Fifth Assessment Report of the Intergovernmental**

 **Panel on Climate Change**

胡永云， **全球变暖的物理基础和科学简史**， 物理， 41卷8期，2012.

**Lecture 2 Introduction to the Economics of Climate Change**

Stern Review, 2007. **The Economics of Climate Change**. Chapter 2, Economics,

 Ethics and Climate Change.

Heal. G, **The Economics of the Climate**, Journal of Economic Literature, 55(3), 1-18, 2017

(Skip the formulas if you do not understand them. Try to capture the essential

topics that are included in climate change economics.)

**Lecture 3 Climate Change Mitigation**

IPCC, 2014: **Summary for Policymakers. In: Climate Change 2014: Mitigation of**

 **Climate Change.**

OECD, 2009: **The Economics of Climate Change Mitigation**. Chapter 2, the

 cost-effectiveness of climate change mitigation policy instruments.

Enkvist P-A, Dinkel J., and Lin C. 2010. **Impact of the Financial Crisis on Carbon**

 **Economics: Version 2.1 of the Global Greenhouse Gas Abatement Cost**

 **Curve**. McKinsey&Company.

**Lecture 4 Climate Change Adaptation**

IPCC, 2014: **Summary for policymakers. In: Climate Change 2014: Impacts,**

 **Adaptation, and Vulnerability.**

Pielke, R., et al. 2007. **Climate change 2007: Lifting the taboo on adaptation**. Nature

 445(7128): 597

**Lecture 5 Cost-and-Benefit Analysis of Climate Change**

Harris J.M., Roach B. and Codur A-M, 2017: **The Economics of Global Climate**

 **Change**. GDAE at Tufts University. (Read Chapter 2)

Nordhaus, W., 2013. **The Climate Casino**. New Haven; London: Yale University Press.

 (Read page 206-219)

Arrow, Kenneth, et al. 2012. **How Should Benefits and Costs Be Discounted in an**

 **Intergenerational Context? The Views of an Expert Panel**. Discussion paper

12-53. Washington, DC: Resources for the Future.

**Lecture 6 Climate Policy in China**

NRDC, P.R. China**, China’s Policies and Actions for Addressing Climate Change**

 **(2017),** 2017.

Zhongxiang Zhang, Climate mitigation policy in China, Climate Policy, 15:sup1, S1-S6,

 2015.

**Lecture 7 The global dimension: the international climate negotiation**

**TBA**

**Lecture 8 Renewable Energy I**

**TBA**

**Lecture 9 Renewable Energy II**