

## Financial Economics of Climate and Sustainability

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### Course Description:

This course explores the intersection of finance, economics, and climate change science to introduce students to the current thinking of financial economists on the most pressing climate change and sustainability issues. Theoretical concepts and empirical applications will present students with a broad perspective on the rich and rapidly evolving field of climate and sustainability finance. Many of the problems are open-ended, reflecting the complexity and deep uncertainty intrinsic to the real-world situations faced by today's decision-makers. The case studies, discussions, and real-world examples will provide additional insights into the implications of climate change for financial markets and the promising strategies for sustainable finance.

### Course Prerequisites:

Minimal -

Introduction to Microeconomics

Introduction to Macroeconomics or Introduction to Statistics

Recommended -

Introduction to Microeconomics

Introduction to Macroeconomics

Introduction to Statistics

### Course Objectives/Learning Outcomes:

Students will gain a broad understanding of the theoretical frameworks, empirical evidence, and practical applications related to financial decision-making in the context of climate risk,

sustainable investing, and evolving policy frameworks. Through case studies, discussions, and real-world examples, we will develop critical thinking skills and insights to analyse the implications of climate change for financial markets and to evaluate strategies for promoting sustainability in the world economy.

### **Course Requirements:**

The course consists of two 90-minute class sessions per week. Sessions will include lectures and practice classes.

A central part of the course is student participation - both using in-class discussion but also by applying the ideas and concepts learned during the course to a group project based on real-life case studies and climate finance policies and commitments.

### **Grading Policy:**

#### **Mandatory Completion Policy**

Note that all mandatory assignments and exams must be completed to the best of your ability in order for your final grade to be issued. Failure to complete a mandatory assignment or exam may result in a failing grade.

Grades are based on the following components:

1. Class participation 15%
2. Group project and final presentations 35%
3. Final exam 50%

For group projects, students will work in small teams on a project that will culminate with a final presentation and a follow-up debates.

- The group projects will focus on analyses of real-world cases of climate finance projects
- Case studies of leading companies introducing successful climate/sustainable finance solutions
- Evaluation of policies and commitments related to climate finance - roadblocks vs success factors. Lessons learned

At the end of the term, cumulative points will be converted into grades by the following scheme:

Letter Grade	Percentage	Description
A	93-100	Outstanding work
A-	90-92	
B+	87-89	Good work
B	83-86	
B-	80-82	
C+	77-79	Acceptable Work
C	73-76	
C-	70-72	
D+	67-69	Work that is significantly below average
D	63-66	
D-	60-62	
F	0-59	Work that does not meet the minimum standards for passing the course

#### **UPCES Academic Integrity Policy**

Plagiarism and other forms of academic dishonesty are not tolerated. The use of Artificial Intelligence (AI) for the development of knowledge and learning is encouraged at many stages of the learning process. While we value technology for educational purposes, we also value originality and the retainment of knowledge, and thus using AI for assignments and examinations, even if rephrased, is strictly prohibited and considered an academic integrity violation, unless the instructor explicitly allows for it in the context of evaluated work

#### **UPCES Non-Discrimination/Harassment Policy**

The UPCES program in Prague promotes a diverse learning environment where the dignity, worth, and differences of each individual are valued and respected. Discrimination and harassment, whether based on a person's race, gender, sexual orientation, color, religion, national origin, age, disability, or other legally protected characteristic, are repugnant and completely inconsistent with our objectives. Retaliation against individuals for raising good faith claims of harassment and/or discrimination is prohibited.

#### **UPCES Diversity Policy**

UPCES fully embraces diversity and strives to create a safe and welcoming environment for students from all backgrounds. Prague is a wonderfully diverse community and UPCES is no different. All students should feel at home while studying abroad and UPCES will do its utmost to make sure that becomes a reality. Although unique challenges may arise, we believe that students from all walks of life will encounter wonderful opportunities for enrichment as they explore a new culture while studying abroad.

## **Weekly Schedule:**

### **Week 1**

*CEE Introductory Lecture Series*

UPCES CEE Introductory Lecture Series

### **Week 2**

*The Science of Climate Change*

- Scientific summary of climate change (IPCC report)
- Causes and consequences of climate change
- Climate models and scenarios

### **Week 3**

*The Role of Finance in Climate Change Policies*

- A stock take on global efforts to address climate change
- The role for climate finance in climate change response
- Key concepts, initiatives, drivers and players, products and services

### **Week 4**

*Foundations of Climate Change and Finance*

- A primer on the economics of climate change
- Theoretical foundations of climate finance – an introduction
- Climate finance, risks and opportunities

### **Week 5**

*Climate Risk and Asset Prices*

- Climate risk and asset prices – theory and empirical evidence
- Integration of climate risk into financial decision-making
- Climate and sustainable finance investing in equity and debt

### **Week 6**

*Climate Finance and Financial Institutions*

- The effects of climate change on banks
- Climate change and the insurance sector
- Financial innovation for climate and sustainability

## **Week 7**

### *Corporate Climate Finance*

- Corporate Carbon Accounting, Reporting and Disclosures. ESG criteria.
- Corporate pledges, actions, and carbon impacts
- Climate commitments and firm performance

## **Week 8**

### *Household Climate Finance*

- Households' awareness and investment decision making
- Climate change considerations and residential choices
- Adoption of climate innovations by households

## **Week 9**

### *Climate Change, Price and Financial Stability*

- Role of central banks and prudential authorities in tackling climate change
- Climate change as a source of monetary and financial instability
- Policy responses of central banks and prudential authorities

## **Week 10**

### *Climate-Stress tests and Scenario Analysis*

- Climate-economic models versus deep uncertainty
- Climate-related risk identification and risk assessment
- Using scenario-based approaches for financial decision-making
- In-class workshop: Cross-Impact Scenario Simulator

## **Week 11**

### *Geopolitics and Geoeconomics of Climate Finance*

- Global power dynamics in climate finance decisions
- Green and Carbon coalitions
- Political economy of selected financing mechanisms in public financing strategies

## **Weeks 12 & 13**

### *Case Studies*

## **Week 14**

### *Finals*

## Readings:

Since climate finance is a very fast-moving area, there is no required textbook for this course. We will work with original research, newspapers articles and other sources. This is a preliminary syllabus that will be subject to minor changes on an ongoing basis. Please see the course Dropbox at the beginning of the Fall semester for the final required readings. Additional readings, articles, and case studies may be provided throughout the course to supplement the enhance student understanding of specific topics.

### Week 2 - The Science of Climate Change

The IPCC “Summary for Policymakers” (33 pp) is a dense and high level summary of the key scientific results on climate change -

[https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_SPM.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_SPM.pdf)

For a very high level understanding of climate models and scenarios, see

<https://www.climate.gov/maps-data/climate-data-primer/predicting-climate/climate-models>

Build your own net zero simulation at <https://www.climateinteractive.org/en-roads/> See instructions below.

### Week 3 – Finance and Climate Change Policies

Simon Black, Ian W.H. Parry, Karlygash Zhunussova. 2023. Is the Paris Agreement Working? A Stocktake of Global Climate Mitigation. IMF Staff Climate Notes 2023/2.

<https://www.imf.org/en/Publications/staff-climate-notes/Issues/2023/11/14/Is-the-Paris-Agreement-Working-A-Stocktake-of-Global-Climate-Mitigation-541083>

Songwe, V., Stern, N., and A.Bhattacharya. 2022. Finance for climate action Scaling up investment for climate and development, Report of the Independent High-Level Expert Group on Climate Finance.

<https://www.lse.ac.uk/granthaminstitute/publication/finance-for-climate-action-scaling-up-investment-for-climate-and-development/>

### Week 4 - Foundations of Climate Economics and Finance

Heal, G. (2017) “The economics of the climate,” *Journal of Economic Literature* 55(3), 1046–63.

<https://www.aeaweb.org/articles?id=10.1257/jel.20151335>

Giglio, S., Kelly, B., & Stroebel, J. (2021). Climate finance. *Annual Review of Financial Economics*, 13, 15-36.

<https://www.annualreviews.org/doi/abs/10.1146/annurev-financial-102620-103311>

### Week 5 - Climate Risk and Asset Prices

Eren, E., Floortje, M., and N. Verhoeven, 2022. Pricing of climate risks in financial markets: a summary of the literature. BIS Papers No. 130.

<https://www.bis.org/publ/bppdf/bispap130.htm>

Flammer, Caroline, 2020. Green bonds: effectiveness and implications for public policy. *Environmental and Energy Policy and the Economy* 1, 95–128.:

<https://www.nber.org/papers/w25950>

### **Week 6 - Climate Finance and Financial Institutions**

BIS, 2023. The effects of climate change-related risks on banks: a literature review, BIS Working Paper 40.

<https://www.bis.org/bcbs/publ/wp40.htm>

Dlugolecki, A., 2008. Climate Change and the Insurance Sector. Geneva Pap Risk Insur Issues Pract 33, 71–90.

<https://doi.org/10.1057/palgrave.gpp.2510152>

### **Week 7 - Corporate Climate Finance**

Kaplan, R. and K. Ramanna (2021). “Accounting for Climate Change” *Harvard Business Review*.

<https://hbr.org/2021/11/accounting-for-climate-change>

Ilhan, Emir, Philipp Krueger, Zacharias Sautner, and Laura T. Starks, 2022, Climate risk disclosure and institutional investors, *Review of Financial Studies*, forthcoming.

[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3437178](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3437178)

Sautner, Zacharias, Laurence van Lent, Grigory Vilkov, and Ruishen Zhang, 2021, Firm-level climate change exposure, *Journal of Finance*, forthcoming.

[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=3642508](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3642508)

### **Week 8 - Household Climate Finance**

Canals-Cerda, José J. and Roman, Raluca A., Climate Change and Consumer Finance: A Very Brief Literature Review (October 1, 2021). FRB of Philadelphia Payment Cards Center Discussion Paper No. 21-4, Available at

<https://www.philadelphiafed.org/-/media/frbp/assets/consumer-finance/discussion-papers/dp21-04.pdf>

Darwin Choi, Zhenyu Gao, Wenxi Jiang, Attention to Global Warming, *The Review of Financial Studies*, Volume 33, Issue 3, March 2020, Pages 1112–1145,

<https://doi.org/10.1093/rfs/hhz086>:

[https://www3.nd.edu/~nmark/Climate/ChoiEtAl\\_AttentionToGlobalWarming.pdf](https://www3.nd.edu/~nmark/Climate/ChoiEtAl_AttentionToGlobalWarming.pdf)

Markus Baldauf, Lorenzo Garlappi, Constantine Yannelis, Does Climate Change Affect Real Estate Prices? Only If You Believe In It, *The Review of Financial Studies*, Volume 33, Issue 3, March 2020, Pages 1256-1295, <https://doi.org/10.1093/rfs/hhz073>,

<https://doi.org/10.1093/rfs/hhz134>

### **Week 9 - Climate Change, Price and Financial Stability**

Brunnermeier, M. and J.P.Landau. 2022. Finance, money, and climate change. 74th Economic Policy Panel Meeting.

[https://www.economic-policy.org/wp-content/uploads/2021/10/9104\\_BrunnermaierLandau.pdf](https://www.economic-policy.org/wp-content/uploads/2021/10/9104_BrunnermaierLandau.pdf)

Bolton, P., Despres, M., Pereira da Silva, L.A., Samama, F., and R.Svartzman. 2020. The green swan. Central banking and financial stability in the age of climate change. BIS Publications.

<https://www.bis.org/publ/othp31.pdf>

### **Week 10 - Climate-Stress tests and Scenario Analysis**

The Task Force on Climate-Related Financial Disclosures (TCFD) has made available substantial materials to support financial professionals on applying climate risk scenarios. Please go through the materials at

<https://www.tcfdfhub.org/scenario-analysis/>

Charlotte Gardes-Landolfini, Pierpaolo Grippa, William Oman, and Sha Yu. 2023. Energy Transition and Geoeconomic Fragmentation: Implications for Climate Scenario Design. IMF Staff Climate Note 2023/003.

<https://www.imf.org/en/Publications/staff-climate-notes/Issues/2023/11/16/Energy-Transition-and-Geoeconomic-Fragmentation-Implications-for-Climate-Scenario-Design-541097>

### **Week 11 – (Geo)politics of Climate Finance**

Gregor Semieniuk et al., “Stranded Fossil-Fuel Assets Translate to Major Losses for Investors in Advanced Economies,” *Nature Climate Change*, May 26, 2022, 1–7,

<https://doi.org/10.1038/s41558-022-01356-y>.

“European court ruling puts cautious Swiss in climate bind.”, Reuters, April 12, 2024.

<https://www.reuters.com/sustainability/european-court-ruling-puts-cautious-swiss-climate-bind-2024-04-12/>

### **Weeks 12-13 – Group projects (no readings)**