Sustainable Finance (FIN-400)

Fall 2025

Instructor: Dr. Federica Zeni – Email: federica.zeni@epfl.ch

Course Description

This course introduces students to the theory and practice of sustainable finance, exploring the interaction between financial markets, environmental policy, and corporate responsibility.

Learning Outcomes

By the end of this course, students will be able to:

1. Explain key concepts in sustainable and ESG investing.
2. Determine expected returns on green/brown equity, green bonds, price derivatives on carbon allowances, and infer disaster risk from option prices.
3. Evaluate the impact of financial markets in achieving environmental goals.

Prerequisites

Basic knowledge of asset pricing and corporate finance. Familiarity with statistics and programming skills (Python, R, Matlab) are recommended.

Course Materials

- Lecture slides posted weekly on `https://moodle.epfl.ch/`.
- Academic articles (reference in the slides), case studies when possibile.
- Textbooks (not mandatory but suggested):
  - Handbook of Sustainable Finance by Thierry Roncally (available for free)
  - Principles of Sustainable Finance by Dirk Shoenmaker and William Schramade
  - Financial Decisions and Markets by John Campbell
  - Arbitrage Theory in Continuous Time by Thomas Bjork
  - Principles of Corporate Finance by Richard A. Breadley, Stewart C. Myers, Franklin Allen and Alex Edmans

Grading

- Problem set (group based - 4 students per group): 30%
- Case Study (group based - approx 5 students per group): 10%
- Final exam: 60%

Policies

Late assignments incur a penalty (with reasonable exceptions). You are welcome to use AI tools in accordance with the current EPFL policies. However, please bear in mind that you are 100% responsible for the final product. AI should help you think not think for you.

Table 1: Class Schedule Fall 25

Week	Date	Structure
1	08 Sept 2025	Lecture (3h)
2	15 Sept 2025	Lecture (3h)
3	**29 Sept 2025**	Lecture (2h) Industry Speaker: Catherine Al Bahou, BCGE (1h)
4	**06 Oct 2025**	Lecture (2h) Industry Speaker: Thomas Schär, SwissRe (1h)
5	13 Oct 2025	Lecture (3h)
6	**27 Oct 2025**	Exam Recap (2h) Industry Speaker: Federico Silvano, Robeco (1h)
7	03 Nov 2025	Lecture (3h)
8	10 Nov 2025	Lecture (3h)
9	**17 Nov 2025**	Lecture (2h) Industry speaker: Tanja Furrer-Turcic, UBS (1h)
10	**24 Nov 2025**	Lecture (2h) Industry speaker: Luis Bryce, APU Capital Advisors (1h)
11	**01 Dec 2025**	Group Case Study (3h)
12	**08 Dec 2025**	Exam Recap (2h) Exec. Lecturer: Amin Kaboli, EPFL (1h)
13	**13 Dec 2025**	Problem Sets Presentations (3h)

Contact and Support

Questions are welcome during office hours. Additional resources are available on `https://moodle.epfl.ch/`. The TA of the course is Caterina Negri caterina.negri@epfl.ch.

Class Schedule (tentative) and Participation Requirements

Table 1 shows the tentative class schedule. Dates in **bold** are highly recommended (guest speakers). Dates in **bold red** are **mandatory**; absences will reduce your grade.

Class Content (updated weekly)

Week 1: **Introduction to Climate Economics**

- The greenhouse gas effect and global warming
- Externalities, Integrated Assessment Models (IAMs), and the DICE model
- The Coase theorem, coordination failures, and the role of private markets

Week 2: **Measuring Climate Risks**

- Transition risks vs. physical risks
- Measurement challenges and the rise of ESG scores
- ESG scoring methodologies and performance evaluation

Week 3: **ESG, Portfolio Choice, and Static Asset Pricing**

- Recap: Markowitz portfolios, the CAPM, and Arbitrage Pricing Theory
- Extending the CAPM: the *green alpha*
- The three–mutual fund theorem and ESG as a second factor
- o *Industry speaker: Catherine Al Bahou, BCGE*

Week 4: **ESG as a Pricing Factor and Hedging Instrument**

- Dissecting green returns: why ESG stocks have outperformed
- Is ESG a pricing factor? The Fama–MacBeth procedure to estimate risk premia
- Hedging climate risk through portfolio-mimicking strategies
- o *Industry speaker: Thomas Schär, SwissRe*

Week 5: **Disaster Risk and Risk-Neutral Pricing**

- Recap: the SDF, Lucas tree model, the equity premium and the volatility puzzle
- Disaster risk and inference from options: Merton (1976), Barro (2009, 2016)
- Pricing options on carbon allowances: digital payoffs

Week 6: **Midterm Recap**

- Review of core topics for the midterm
- o *Industry speaker: Federico Silvano, Robeco*

Week 7: **History of Corporate Social Responsibility**

- What is the objective of the corporation? Bowen (1953) vs. Friedman (1970)
- Corporate governance mechanisms
- Doing well by doing good? Moving from short-term to long-term horizons.

Week 8: **ESG Investing in Public Equity**

- Basics of equity markets and capital structure theory
- The cost-of-capital channel and the real impact of exclusionary investing
- Can ESG investing replicate a carbon tax? When is voice better than exit?

Week 9: **ESG Investing in Public Debt**

- Greenwashing concerns
- Sustainable debt instruments: Green Bonds vs. Sustainability-Linked Bonds
- Measuring the green premium in bond markets
- o *Industry speaker: Tanja Furrer-Turcic, UBS*

Week 10: **Frontier Topics in Sustainable Finance**

- Carbon offsets and the evolution of voluntary carbon markets

- Climate insurance, adaptation finance, and CAT green bonds
  - *Industry speaker: Luis Bryce, APU Capital Advisors*

Week 11: **Case Study: Financing the Green Transition**

- Group work on case study
- In-class presentations

Week 12: **End-of-Term Recap**

- Final review of topics for the exam
  - *Executive lecturer: Amin Kaboli, EPFL*

Week 13: **Problem Set Presentations**

- Group presentations of problem set work
- Q&A session on exam preparation