Instructor Information

- Instructor: Stephen R. Freedman
- Email: sf147@nyu.edu
- Office Address: n.a.
- Office Hours: by appointment.

Course Information

- Class Meeting Times: Saturdays 24 April and 1 May, 2021, 9:30am-12pm and 2pm-4:30pm ET.
- Class Location: conducted via Zoom, details to be provided during week before first class

Course Prerequisites

- CORE-GP 1021 and CORE-GP 1022
- URPL-GP 2660
- PADM-GP 2311 recommended

Course Description

How can financial capital be deployed to help solve the most pressing environmental problems of our time? This course will provide students a thorough understanding of how key environmental challenges can be addressed through innovative financing techniques and investment strategies. Students will be introduced to key thematic areas of environmental finance such as water, energy, waste management and sustainable agriculture. They will learn about financial instruments, structures, investment approaches and asset classes that can be relied upon to achieve positive environmental outcomes and impact including, but not limited to,
private market investments, green bonds, pay-for-success agreements, shareholder engagement, trading in environmental certificates, and conservation finance.

**Course and Learning Objectives**

By the end of the course, students should be able to

1. recognize key environmental challenges and the potential for investment capital to help address them
2. understand the main instruments of environmental finance across asset classes with their strengths and limitations
3. understand the specificities of environmental finance in the main thematic areas of water, food, energy/climate change and waste.
4. identify and evaluate specific investment opportunities by applying concepts of environmental finance

**Learning Assessment Table**

<table>
<thead>
<tr>
<th>Graded Assignment</th>
<th>Course Objective Covered</th>
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</thead>
<tbody>
<tr>
<td>Participation (live)</td>
<td>All</td>
</tr>
<tr>
<td>Participation (preparation assignments)</td>
<td>#1</td>
</tr>
<tr>
<td>Assignment 1</td>
<td>#2, #3</td>
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<tr>
<td>Final Exam</td>
<td>#2, #3, #4</td>
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**Reading Materials**

There is no assigned textbook for this course. Reading material is based on publicly available reports and articles.

For students who would like to brush up on introductory finance and investments, the following resources may be consulted:


Great online investment resource: [www.investopedia.com](http://www.investopedia.com)

Useful education site at the SEC: [https://www.investor.gov/introduction-investing](https://www.investor.gov/introduction-investing)
Academic Integrity

Academic integrity is a vital component of Wagner and NYU. All students enrolled in this class are required to read and abide by Wagner’s Academic Code. All Wagner students have already read and signed the Wagner Academic Oath. Plagiarism of any form will not be tolerated and students in this class are expected to report violations to me. If any student in this class is unsure about what is expected of you and how to abide by the academic code, you should consult with me.

Henry and Lucy Moses Center for Students with Disabilities at NYU

Academic accommodations are available for students with disabilities. Please visit the Moses Center for Students with Disabilities (CSD) website and click on the Reasonable Accommodations and How to Register tab or call or email CSD at (212-998-4980 or mosescsd@nyu.edu) for information. Students who are requesting academic accommodations are strongly advised to reach out to the Moses Center as early as possible in the semester for assistance.

Class Policies

This course will abide by the Wagner School’s general policy guidelines on incomplete grades, academic honesty, and plagiarism. It is the student’s responsibility to become familiar with these policies. All students are expected to pursue and meet the highest standards of academic excellence and integrity. Please familiarize yourself with the following guidelines:

Incomplete policy, Course withdrawal policy, Grading policy

Assignments and Evaluation

Class Participation (including case study): 30% of total grade

Participation is awarded based on two aspects, which will receive equal weight: 1) On-time submission and passing grade for two preliminary assignments due prior to the first live class. The assignments will be evaluated on a pass or fail basis, 2) attendance, punctuality and engagement in class discussions. Giving the concentrated format of the course over two consecutive Saturdays, missing more than 1 hour will negatively impact your participation grade. Extraordinary circumstances include religious observances and illness but you must give notice via email as soon as possible. All students benefit from high levels of participation, so you are expected to do readings prior to class, attend class, and contribute to the discussion. Attendance is taken via Zoom. I will be making note of those who routinely participate in the discussion. Active participation during the case study in week 2 will receive particular weight.
Written Assignment (due on week 2, 1 May 2020): 25% of total grade

Final Take-Home Exam (due on 7 May 2020): 45% of total grade

NYU Classes
All announcements, resources, and assignments will be delivered through the NYU Classes site. I may modify assignments, due dates, and other aspects of the course as we go through the term with advance notice provided as soon as possible through the course website.

Overview of Semester

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1, morning, lecture 1</td>
<td>24 April</td>
<td>Introduction: key environmental challenges and concepts</td>
<td></td>
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<tr>
<td>Week 1, morning, lecture 2</td>
<td>24 April</td>
<td>Investment instruments available to finance environmental goals</td>
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<tr>
<td>Week 1, afternoon, lecture 3</td>
<td>24 April</td>
<td>Waste management and the circular economy</td>
<td></td>
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<tr>
<td>Week 1, afternoon, lecture 4</td>
<td>24 April</td>
<td>Sustainable agriculture</td>
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<tr>
<td>Week 2, morning, lecture 1</td>
<td>1 May</td>
<td>Climate change investing</td>
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<tr>
<td>Week 2, morning, lecture 2</td>
<td>1 May</td>
<td>Case study on renewable energy</td>
<td>Case study</td>
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<tr>
<td>Week 2, afternoon, lecture 3</td>
<td>1 May</td>
<td>Water</td>
<td>Written assignment</td>
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<tr>
<td>Week 2, afternoon, lecture 4</td>
<td>1 May</td>
<td>Miscellaneous concluding topics</td>
<td></td>
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<tr>
<td>7 May</td>
<td></td>
<td>Final take-home exam due</td>
<td>Written assignment</td>
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Detailed Course Overview

Week 1, Lecture 1: Introduction
- Scale of environmental challenges (global footprint network, planetary boundaries)
- The Environment within the UN’s Sustainable Development Goals
- Critical need for private capital given scope of funding gap
• Interdependencies abound: The water – energy – food nexus
• Overview of course

Reading Materials

Overview of Environmental Challenges:

Business case Environmental Sustainability:

The role of private capital:

Acknowledging interdependencies:

Week 1, Lecture 2: Investment instruments available to finance environmental goals
• Overview of asset classes and instruments
• Listed market instruments
• Private markets investments (Equity, debt, real assets)
• Thematic equity investments
• Shareholder engagement
• Green bonds
• Pay-for-success contracts
• Other innovative social finance instruments
• Conservation finance

Reading Materials

Overview of Investment Instruments:

**Thematic equity investments:**
- Pictet Asset Management (2018), Global Environmental Opportunities: Transforming Sustainable Investment, Geneva

**Green bonds:**

**Environmental impact bonds:**

**Shareholder engagement (examples):**
- Trillium Asset Management shareholder proposal for Whole Foods Market.

**Optional reading:**

**Week 1, Lecture 3: Waste management and the circular economy**
- Limits of linear economy
- Introducing the circular economy
- Rethinking business and production processes
- Merging of impact investing and ESG

**Reading Materials**

**Waste Management:**
Circular Economy:

- Closed Loop Partners (2017), "Capital Landscape for Investment in Circular Supply Chains", September

Optional reading:


Week 1, Lecture 4: Sustainable agriculture

- Challenge of feeding 9 billion people
- Limits arising from food - water - energy nexus
- Harnessing natural processes: holistic approaches
- Role of technology
- Sustainable agriculture as climate change adaptation

Reading Materials

Agricultural sector:


Investing in agriculture:


Optional reading
• Murray, L. and McGrath, M. (2016), "Sustainable Farmland Investment Strategies: An Introduction to Current Conditions", Yale School of Management & Yale School of Forestry and Environmental Studies, November.

Week 2, Lecture 1: Climate change investing

• Mitigation vs adaptation
• Pathways to 2 degrees warming scenario: all hands on deck
• Renewable energy
• Energy efficiency
• Going carbon negative? Carbon capture and storage

Reading Materials

Overview of investment options for climate change investing:
• Boston College Center for Corporate Citizenship (2009), "Handbook on Climate-Related Investing across Asset Classes", Boston College Carroll School of Management, Institute for Responsible Investment.

Investing in Mitigation:
• IEA (2015), "Carbon Capture and Storage: The solution for deep emissions reductions".

Investing in Adaptation:

Emissions Trading:
• California Environmental Protection Agency (2015), Overview of ARB Emissions Trading Program.

Optional reading
• Haszeldine et al. (2018), “Negative emissions technologies and carbon capture and storage to achieve the Paris Agreement commitments”, Philosophical Transactions, Royal Society, Volume 376, Issue 2119.
Week 2, Lecture 2: Case study renewable energy

- Renewable energy case study
- Limits of linear economy
- Introducing the circular economy
- Rethinking business and production processes
- Merging of impact investing and ESG

Reading Materials

Case study

- [https://hbsp.harvard.edu/import/721782](https://hbsp.harvard.edu/import/721782)

Week 2, Lecture 3: Water

- Challenge of water scarcity
- Water cycle and water value chain
- Types of investment (infrastructure: green vs grey, treatment, contamination prevention, demand management etc.)
- Water investments as climate change adaptation
- Water rights and water markets

Reading Materials

Water Investing:


Water rights:

Optional reading:

Week 2, Lecture 4: Miscellaneous concluding topics
- Environmental Finance and developing countries: triple bottom line opportunities
- Outlook

Reading Materials

Conservation Finance:
- Credit Suisse (2016), "Conservation Finance, From Niche to Mainstream: The Building of an Institutional Asset Class".

Environmental Finance in Developing Countries:
- UNEP (2016), “Green Finance for Developing Countries: Needs, Concerns and Innovations”, July

NYU’s Calendar Policy on Religious Holidays

NYU’s Calendar Policy on Religious Holidays states that members of any religious group may, without penalty, absent themselves from classes when required in compliance with their religious obligations. Please notify me in advance of religious holidays that might coincide with exams to schedule mutually acceptable alternatives.