**Explanation of the course Transdisciplinary Case Study at Utrecht University, The Netherlands**

This document contains:

A. an explanation of the course (pages 1 and 2)

B. a Format to deliver your question/case (page 3 and 4)

**A) Explanation of the course**

**1. Master's degree programs in Sustainable Development + Water Science and Management (Utrecht University)**

The Master's programs in Sustainable Development and Water Science and Management at Utrecht University are 2-year international Master's degree programs (intake of approximately 40% foreign, 60% Dutch). The language of instruction is English.

Both masters focus on Sustainable Development from:

• *joint* courses on Sustainable Development. One of those courses is called Transdisciplinary Case Study (see description below)

• a specialization in 1 of the following directions:

A. Energy & Materials

Strategies for the sustainable use of energy and raw materials, from a natural scientific background, but aimed at application in society. Combination of knowledge from geosciences, environmental sciences, innovation studies, economics, policy analysis and engineering sciences.

B. Environmental Change & Ecosystems

Focus on sustainable use of land, water, soil, atmosphere and ecosystems. Analysis of the chain: land use 🡪 environmental quality / effects 🡪 effects on biodiversity. Approaches from ecology, hydrology, soil science, toxicology, chemistry, focused on policy and management.

C. Water Science and Management

Focus on water management, based on general knowledge of technical aspects with an eye for social implementation. Focused on sustainable development taking into account social functions, costs and benefits.

D. Earth System Governance

Focus on the management of social changes for achieving a sustainable society. Critical evaluation of various forms of social change, from knowledge from sociology, policy studies, geography, planning, economics and law. Special attention to governance for the creation of organizational, procedural and moral frameworks for stakeholders (state, citizens, companies) in the pursuit of sustainable development.

E. International Development

Focus on economic and social development in developing countries. For this course, these students can be compared with students from track D, because they use comparable analyses and methods to achieve social changes aimed at sustainable development.

**2. Course "Transdisciplinary Case Study"**

The course Transdisciplinary Case Study is the fourth and final *joint* course for both master programs. The course is taught in English (about 60% students from the Netherlands, about 40% from abroad).

It concerns 5th-year students who already finished their specialization courses, and almost start their graduation research/internship.

However, they must first do one more course in which they work in *multidisciplinary* teams on a joint Sustainability issue.

The learning objective of the course is that students learn:

- to arrive at an integral advice / solution for the sustainability issue;

- learn to work in a group with students with different specialization

- gain insight into sustainability issues from practice

- learn to work for a real client from outside the university

Teams consist of about 6 students from different disciplinary (track) backgrounds; see page above.

Examples of Sustainability issues in this course are:

- Possibilities of green roofs for water management

- Sustainable urban neighborhoods

- Urban agriculture and circular economy

- Use of green gas for the Amsterdam city car park

- Sustainability analysis of organizations

- Smart grids for sustainability

- Etc.

Related to the central sustainability demand of a client from society, students write a report in which they make a Problem Analysis and then try to arrive at an ***integrated*** Answer/Advice regarding the central Sustainability question.

The course runs each year from the beginning of September to the end of October, and covers a total of 5 weeks of full-time work spread over a period of 10 weeks. The student teams will roughly spend 1200 hours on the client’s Case.

Sustainability issues ("Cases") are provided by parties from society: governments, companies, NGOs, citizens, etc.

These parties (called "Clients") must fulfill the following conditions:

1. They provide a Case description with a central question concerning a Sustainability issue (in the broadest sense of the word);

2. They are available in the period from the beginning of September to the end of October for:

* explanation of the Case to the students
* answer questions from students
* supplying data / literature etc.
* giving Feedback on the written Setup and Draft of the final report.
* (estimated minimum commitment 2-3 days total over 10 weeks duration)

In order to assess whether a case submitted by a social party is suitable for the course, it is requested to fill in the Format below for the Case Description.

Based on this, it is determined whether the case can be included within the course.

🡪 Please send the completed Format to Dr. Paul Schot, coordinator of the course at Utrecht University ([p.p.schot@uu.nl](mailto:p.p.schot@uu.nl)).

**B) Format: Description of the Case Study**

🡪 Blue text is an example. Please replace the blue texts in the table with your own text (in English !)

🡪 Try to fill at least 2 out of 3 boxes for A, B and C; and at least 1 out of 2 for D and E.

|  |  |  |
| --- | --- | --- |
| **General information** |  | |
| Title | Energy storage/retrieval from lakes in relation to Waternet’s responsibilities | |
| Name of responsible person | ................. ( + e-mail adress) | |
| Organisation of responsible person | …………. (for instance Waternet) | |
| Problem description | Plans are underway to use deep cold water stored in lakes for cooling of office buildings. Although this has energetic advantages and contributes to CO2- and climate change abatement, there are concerns about the effects on lake water quality. One effect may be that phosphates stored in the lake bottom are mobilised, leading to a deterioration of water quality. As Waternet is responsible for the lake water quality they have to be aware of poosible problems arising from such new developments related to energy saving, and the options that exist to handle these. | |
| Central research question | How can energy retrieval and storage from deep lakes (Ouderkerkerplas, Sloterplas) be combined with water quality and other tasks tasks of Waternet? | |
| **Suitable for student from track:** | Disciplinary (track-specific) **research questions** | Suggested research **methods** |
| A. Energy & Materials | 1. How much energy reduction is possible by using deep cold water from lakes for office cooling? 2. What is the best mix of energy sources for transport/ pumping etc. viewed from a sustainability perspective? 3. … | \* international literature review on …..  \* Interviews with experts from …  \* Energy analysis calculation of …. |
| B. Environment & Ecosystems  (soil, air, water, ecosystems) | 1. What is the effect of energy retrieval/storage on yearly CO2 emissions? 2. What are the effects on lake ecosystems? | \* international literature review on energy retrieval/storage from lakes  \* Interviews with experts from … |
| C. Water science and management | 1. What is the effect of energy retrieval/storage on PO4 concentrations in lake? 2. What are the effects on the vertical water layering in the lake? |  |
| D. Governance | 1. What are the legal responsibilities of Waternet concerning water problems resulting from energy storage in lakes? 2. In what way can Waternet cooperate/ have partnerships with third parties such that it safeguards its own responsibilities and liability, while at the same time making a positive contribution to CO2 reduction and climate change abatement? 3. … | \* State of the Art literature review on partnerships concerning ….  \* Interviews with experts from …  \* Stakeholder analysis on … |
| E. International Development | not relevant |  |
| Additional remarks | We are specifically looking for information/advice on ….………….  The study of …. should be incorporated in the study.  Stakeholders to be consulted are ….….  End product should be in the form of a poster/ spreadsheet/ …..  ….etc. | |

🡪 Please send back to [p.p.schot@uu.nl](mailto:p.p.schot@uu.nl)

Thank you very much !

Dr. Paul Schot

Environmental Sciences

Utrecht University