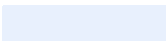


# Sustainability Course Catalogue

A list of courses relating to the Sustainable Development Goals and sustainability at large.

May 2022



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# About this report

ETH Zurich wants to equip students with relevant knowledge, skills and attitudes to contribute to a sustainable development. This report was compiled to provide interested students with an initial overview of the variety of courses that address sustainability. For the lecturers, this report will hopefully serve as resource to connect with their colleagues within the university.

To capture the full range of sustainable development, we structured this report around the 2030 Agenda for Sustainable Development. The Agenda 2030 offers a global vision for a sustainable future and was adopted by all United Nations member states in 2015. At its heart are the 17 Sustainable Development Goals (SDGs) and their 169 sub-targets. The SDGs represent an urgent call to action by all countries in a global partnership. Striking a fine balance, they account for the economic, social and ecological dimensions of sustainable development.

# Methods

ETH Sustainability, ETH Zurich's sustainability office, determined 575 keywords related to the 17 SDGs, their sub targets and related indicators. With the help of ETH Zurich's Institutional Research team, the keywords were applied to the comprehensive course catalogue, including the title, description and learning objectives of each course. Of the 575 keywords, 163 keywords were found within the course catalogue (28%). The search detected 978 courses from the course catalogue, from which 216 courses were selected according to SDG relevance. Hereby assessing firstly, whether a course is relevant to the topic of the SDG and secondly, whether the knowledge and skills transmitted in the course would serve to reach any of the related sub-goals. This was done based on the course description in the course catalogue.

In the next section, you find the resulting courses arranged by SDG. Texts were sourced directly from the course catalogue, reflecting the content and language choice of the individual lecturers.

Please let us know if there are any SDG relevant courses missing or if you have any feedback on how to improve the usability of this report. Contact us via [sustainability@ethz.ch](mailto:sustainability@ethz.ch).

The second version of this report was published in May 2022.

# General Sustainability Courses

## 701-0900-00L The Sustainable Development Goals in Context

**Semester:** 2022S

**Relevant SDGs:** all SDGs and sustainability in general

**ECTS:** 2

**Lecturer:** Kassab, Omar; Wehrli, Bernhard

### **Abstract**

The United Nations Agenda 2030 and its 17 Sustainable Development Goals (SDGs) provide an opportunity for the international community to shape the course of sustainable development. With their range of expertise, universities can develop the science to help achieving the SDGs. The lectures center on sustainability challenges and provide context from academics and societal actors.

### **Objective**

1. Students know important dimensions of sustainable development and the discourses in the context of the SDGs
2. Students get an overview how ETH Zurich contributes to sustainable development and the achievement of the SDGs
3. The lecture series enables students to contribute to sustainable development during their studies and research, as graduates on the job market, and as members of the society
4. Writing and reviewing a short blog post trains students to communicate acquired knowledge effectively for a broader audience.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157271&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 851-0101-74L Sustainable Development - Bridging Art and Science

**Semester:** 2022W

**Relevant SDGs:** all SDGs and sustainability in general

**ECTS:** 3

**Lecturer:** Neve, Jasmine Susan; Patel, Shruti Suryakant

**Abstract**

In this course students deepen their knowledge about global development and sustainability issues. We will show five movies each of them linked to one of the five P`s (Planet, People, Prosperity, Peace and Partnerships) reflecting the topics of the 2030 Agenda. Afterwards the movie will be critically discussed with researchers and relevant stakeholders from the broader society.

**Objective**

- Students get a broad understanding of some of the most important issues and discussions related to sustainable development.
- Students get exposed to diverse realities of young people in developing countries
- Students can critically reflect upon the information that is presented to them in the movies and relate it to the broader discussions around sustainable development.
- Students reflect on issues concerning communicating research and the realities of low-income settings to a wider public.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163862&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

## 860-0022-00L Complexity and Global Systems Science

**Semester:** 2022S

**Relevant SDGs:** all SDGs and sustainability in general

**ECTS:** 3

**Lecturer:** Helbing, Dirk; Mahajan, Sachit

**Abstract**

This course discusses complex techno-socio-economic systems, their counter-intuitive behaviors, and how their theoretical understanding empowers us to solve some long-standing problems that are currently bothering the world.

**Objective**

Participants should learn to get an overview of the state of the art in the field, to present it in a well understandable way to an interdisciplinary scientific audience, to develop models for open problems, to analyze them, and to defend their results in response to critical questions. In essence, participants should improve their scientific skills and learn to think scientifically about complex dynamical systems.

### **Comment**

Number of participants limited to 50.

Prerequisites: solid mathematical skills.

Particularly suitable for students of D-ITET, D-MAVT and ISTP

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158602&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 351-1138-00L PRISMA Capstone - Rethinking Sustainable Cities and Communities

**Semester:** 2022S

**Relevant SDGs:** all SDGs and sustainability in general

**ECTS:** 4

**Lecturer:** Augsburger, Michael Jonas; Cabello Llamas, Alan

### **Abstract**

The goal of this intense one-week course is to bring students from different backgrounds together to make connections between disciplines and to build bridges to society. Supported by student coaches and experts, our student teams will use hands-on Design Thinking methods to address relevant challenges based on the UN sustainable development goals.

### **Objective**

In this intense 7-day block course students will be able to acquire and practice essential cross-disciplinary competencies as well as gaining an understanding of a human-centered innovation process. More specifically students will learn to:

- Work and think in a problem-based way.
- Put their own field into a broader context.
- Engage in collaborative ideation with a multidisciplinary team.
- Identify challenges related to relevant societal issues.
- Develop, prototype and plan innovative solutions for a range of different contexts.
- Innovate in a human-centered way by observing and interacting with key stakeholders.

The acquired methods and skills are based on the ETH competence framework and can be applied to tackle a broad range of problems in academia and society. Moving beyond traditional teaching approaches, this course allows students to engage creatively in a process of rethinking and

redesigning aspects and elements of current and future urban areas, actively contributing towards fulfilling the UN SDG 11.

#### **Comment**

Bachelor students get preferential access to this course. All interested students must apply through a separate application process at: [https://mtecezh.qualtrics.com/jfe/form/SV\\_cx4ZghhYhQAY3nT](https://mtecezh.qualtrics.com/jfe/form/SV_cx4ZghhYhQAY3nT)

Participation is subject to successful selection through this sign-up process.

#### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157889&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 701-1551-00L Sustainability Assessment

**Semester:** 2022W

**Relevant SDGs:** all SDGs and sustainability in general

**ECTS:** 3

**Lecturer:** Krütli, Pius; Nef, Danny Philipp

#### **Abstract**

The course teaches concepts and methodologies of sustainability assessment. A special focus is given to the social dimension and to social justice as a guiding principle of sustainability. The format of the course is seminar-like, interactive.

#### **Objective**

At the end of the course, students:

- know core concepts of sustainable development, main features of social justice in the context of sustainability, a selection of methodologies for the assessment of sustainable development
- have a deepened understanding of the challenges of trade-offs between the different dimensions of sustainable development and their respective impacts on individual and societal decision-making

#### **Comment**

Number of participants is limited to 35.

Registration for the course is possible until 30.09.2022, Waiting list will be deleted at the same date..

#### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162164&semkez=2022W&ansicht=KATALOGDATEN&lang=de>



## 701-1502-00L Transdisciplinary Case Study

**Semester:** 2022S

**Relevant SDGs:** all SDGs and sustainability in general

**ECTS:** 7

**Lecturer:** Krütli, Pius; Stauffacher, Michael; Vienni Baptista, Bianca

### Abstract

This course is a research based teaching activity organized in a real-world setting. Students work independently in groups and learn to formulate research questions, apply different methods of data collection and data analysis and to work in an interdisciplinary team as well as in close exchange with society.

In 2021, the case is the Biosphere Entlebuch, a region in the Canton of Lucerne.

### Objective

Students learn how to plan and implement their research work in interdisciplinary and intercultural teams of students. This includes: structure ill defined and wicked problems; derive relevant research questions; design research plans; apply qualitative and quantitative research methods; work in interdisciplinary and inter-cultural teams; organise transdisciplinary collaboration between science and society.

### Comment

Number of participants limited to 25.

Students have to apply for this course by sending a two-page motivation letter (why are you interested? what do you want to learn? what can you contribute?) to michael.stauffacher@usys.ethz.ch and pius.kruetli@usys.ethz.ch.

Important: for students in Agricultural Sciences, the case study can replace the compulsory course 751-1000-00L Interdisciplinary Project Work!

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157347&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 701-1504-00L ETH Sustainability Summer School

**Semester:** 2022S

**Relevant SDGs:** all SDGs and sustainability in general

**ECTS:** 3

**Lecturer:** Krütli, Pius; Rom, Adina Esther; Tilley, Elizabeth Anne; Zurbrügg, Christian

### **Abstract**

The ETH Global Development Summer School provides young researchers with the opportunity to work on current and sustainability-related topics in interdisciplinary and intercultural teams. Focus is given not only to teaching theoretical knowledge but also to solving specific case studies.

### **Objective**

Within ETH Zurich's Critical Thinking Initiative (CTI), students further develop their critical thinking and communications skills including: the capability to analyse and reflect critically, to form an independent opinion and develop a point of view, as well as to communicate, argue and act in an effective and responsible manner.

Based on this concept, the ETH Global Development Summer School is providing its students with the following qualifications and learning outcomes:

- Interdisciplinary and multicultural competence: Students gain basic knowledge in scientific disciplines beyond their own and learn how to work effectively in interdisciplinary and multicultural teams.
- Methodological competence: Students gain basic knowledge of different scientific methods beyond their selected study discipline.
- Reflection competence: Students learn to critically reflect their own way of thinking, their own research approaches, and how academia influences and interacts with society at large.
- Implementation skills: Students will apply creative technologies in solution finding processes to gain knowledge and prototyping-skills to increase hands-on experience by applying knowledge in concrete cases.

This year's event on solid waste management is a collaboration between ETH for Development (ETH4D) and Kwame Nkrumah University of Science and Technology (KNUST, Kumasi, Ghana), and will take place at ETH Zurich, Switzerland.

To find more information and to register, visit our website: <https://eth4d.ethz.ch/Learning/winter-summer-schools.html>

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158241&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 851-0652-00L Make Your Own Short Film about Global Development Research

**Semester:** 2022W

**Relevant SDGs:** all SDGs and sustainability in general

**ECTS:** 0.5

**Lecturer:** Rom, Adina Esther

**Abstract**

In this workshop, students will learn how to create a short film about their research related to global sustainable development using their smartphones. They will also reflect on the power of films to reproduce or break prejudices and stereotypes in global development. Short theoretical inputs will be combined with practical work on students' own video projects.

**Objective**

Students know how to tell an interesting story about their research and how to shoot and cut a short movie using conventional smartphones and laptops.

Students know strategies to ensure that the stories they tell do not reproduce stereotypes.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=165138&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 865-0047-00L Strategies for Behaviour Change

**Semester:** 2022S

**Relevant SDGs:** all SDGs and sustainability in general

**ECTS:** 1

**Lecturer:** Patel, Shruti Suryakant

**Abstract**

In this course students deepen their knowledge of how individuals behave and make decisions. Students learn about the latest insights from behavioural science and explore how they can be applied to tackle global development and sustainability challenges. Students also gain an understanding of the limitations and challenges associated with behaviourally-informed policies.

**Objective**

- Students gain a broad understanding of the factors that influence people's economic and non-economic decisions
- Students appreciate the ethical objections to behavioural interventions and can understand their limitations
- Students become more aware of their own biases and are able to recognise biases in others
- Students can identify opportunities for designing more behaviourally-informed policies in the realms of development and sustainability, and are able to assess their effectiveness

**Comment**

Only for MAS/CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation.

ETH doctoral students working on topics related to poverty reduction in low- and middle income countries may also be admitted.

Registration only through the NADEL administration office.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159828&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# SDG 1 – No Poverty

## 865-0003-00L Development Economics

**Semester:** 2022W

**Relevant SDGs:** SDG01, SDG08, SDG10

**ECTS:** 3

**Lecturer:** Günther, Isabel; Harttgen, Kenneth

### **Abstract**

This course is an introduction to theoretical and empirical discussions on economic development, with a focus on the challenges of developing countries over the last 50 years. The course provides answers to the following questions: How can and should development be measured? What factors drive economic growth and contribute to poverty reduction?

### **Objective**

Students are able to:

- critically discuss economic questions in the context of developing countries
- critically discuss policy recommendations for economic development.

### **Comment**

Nur für MAS in Entwicklung und Zusammenarbeit.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162407&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 751-1500-00L Entwicklungsökonomik

**Semester:** 2022S

**Relevant SDGs:** SDG01, SDG10

**ECTS:** 3

**Lecturer:** Günther, Isabel; Harttgen, Kenneth

**Abstract**

Einführung in theoretische und empirische Grundlagen wirtschaftlicher Entwicklung. Theorie der Wirtschaftspolitik für Armutsreduktion.

**Objective**

Das Ziel dieser Vorlesung besteht darin, die Studierenden in grundlegende entwicklungsökonomische und damit verwandte wirtschafts- und entwicklungspolitische Zusammenhänge einzuführen.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157512&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 865-0000-03L Contemporary Development Debate – Fighting Extreme Poverty in the 21st Century

**Semester:** 2022S

**Relevant SDGs:** SDG01, SDG10

**ECTS:** 1

**Lecturer:** Günther, Isabel; Hensgen, Leonie; Humphrey, Christopher Strong; Patel, Shruti Suryakant

**Abstract**

The training course provides an introduction into strategic schools of thought that are important in current theoretical discussions and policies of development cooperation.

**Objective**

The training course provides an introduction into strategic schools of thought that are important in current theoretical discussions and policies of development cooperation.

**Comment**

Only for CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation.

ETH doctoral students working on topics related to poverty reduction in low- and middle income countries may also be admitted.

Registration only through the NADEL administration office.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158989&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# SDG 2 – Zero Hunger

## 751-1652-00L Food Security - From the Global to the Local Dimension

**Semester:** 2022S

**Relevant SDGs:** SDG02

**ECTS:** 2

**Lecturer:** Barjolle, Dominique; Sonneveld, Martijn Willem

### **Abstract**

Food security, environmental health and quality, and social well-being represent key outcomes of sustainable food systems. Achieving global food security is an important element of the Un Agenda 2030 and its Sustainable Development Goals. The course will explore the contribution of Sustainable Food Systems to achieve the SDGs.

### **Objective**

This year, the focus of the course will be on nutrition in city ecosystems. We will link the topic to an ongoing research project, the NICE project. This project is supported by the Swiss Agency for Development and Cooperation (SDC). It is implemented and co-financed by a public-private Swiss consortium comprising the Swiss Tropical and Public Health Institute (Swiss TPH), ETH Zürich (Sustainable Agroecosystems Group & Laboratory of Sustainable Food Processing and World Food Systems Centre), Sight and Life, and the Syngenta Foundation for Sustainable Agriculture.

We will explore the demand and supply side of food systems with a strong focus on cities. We study how social business models local governance capacity can potentially increase the production and demand for foods produced locally and in a sustainable manner based on agroecological principles to make food value chains more nutrition-focused to contribute to better health. We want to discuss explore and learn how multi-stakeholder and multisectoral collaboration can bring city authorities, local businesses, and civil society together to create a dynamic network of city learning hubs for dissemination and scale up.

The aim is to learn, discuss and reflect, both based on conceptual level as well as based on concrete city cases, about promising transformation pathways towards sustainable food systems. Students will learn from practical experiences and discuss in groups and with experts from FAO and other organizations, the complexity of sustainable food system and how possible pathways towards better and more sustainable local food systems could look like. The students should discover and explore approaches, tools, strategies, and policies which support the transition of food systems or specific elements of them at different scale: local, national, or even global. We want to address how the barriers to adopt them could be overcome.

### **Comment**

Only for Agriculture Science MSc and Environmental Sciences MSc

Participants are selected after an application process. Information regarding the application processes will be given at the first information event (tbd).

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157157&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 865-0000-09L Towards Food and Nutrition Security

**Semester:** 2022S

**Relevant SDGs:** SDG02

**ECTS:** 2

**Lecturer:** Patel, Shruti Suryakant

### **Abstract**

Ensuring food security for a growing global population will require a fundamental shift in the way we understand and manage food production, distribution and consumption. This course will examine various aspects of food security, and explore ways and means in which the availability, accessibility and utilization of safe and nutritious food can be improved, especially in developing countries.

### **Objective**

The objective of the course is to develop the participants' knowledge and understanding of the challenges facing food and nutrition security at global and local levels and discuss and compare options for how we can move towards food security and improved nutrition in various contexts.

### **Comment**

Only for MAS/CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation.

Doctoral students dealing with empirical research in the area of development and cooperation (EZA) may be admitted "sur Dossier".

Registration only through the NADEL administration office.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159820&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 751-2102-00L History of Food and Agriculture

**Semester:** 2022S

**Relevant SDGs:** SDG02

**ECTS:** 3

**Lecturer:** Aerni, Philipp Gregory

## **Abstract**

Knowledge about the history of food and agriculture is crucial to understanding the emergence of modern agriculture and public resistance to industrial farming. The lecture discusses the evolution of agriculture and its impact on social structures, human health and the environment from an anthropological, a cultural, a political and a technological point of view.

## **Objective**

- to become familiar with the milestones of the history of food and agriculture
- to understand innovation in agriculture as one of the major forces of change in the history of mankind
- to learn how perceptions, politics and policies in food and agriculture are shaped by social, technological and environmental change
- to be able to embed the current debate on the food crisis and climate change into a historical context

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158958&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 865-0010-02L Food Security and Agriculture

**Semester:** 2022W

**Relevant SDGs:** SDG02

**ECTS:** 2

**Lecturer:** Patel, Shruti Suryakant

## **Abstract**

Food security has been on top of the policy agenda for decades, but still a considerable proportion of the population in developing countries remains hungry and malnourished. This lecture series will explore how we produce and distribute food; analyse the concept of food security and discuss ways and means for increasing the availability and accessibility of food in developing countries.

## **Objective**

The student will be able to:

- describe the most important milestones in the history of food and agriculture
- understand the concept of food security and discuss causes and impact of food insecurity
- compare different approaches to promote and increase crop- and livestock production in a sustainable manner
- reflect on some of the main economic challenges of the world food system and understand some of the tradeoffs between smallholders' decisions of labor, consumption, and production of food
- give insights in how international organizations work with farmers and governments in developing countries to ensure availability and equal access to food

#### **Comment**

Nur für MAS in Entwicklung und Zusammenarbeit.

#### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163829&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 751-2105-00L Political Ecology of Food and Agriculture

**Semester:** 2022W

**Relevant SDGs:** SDG02

**ECTS:** 3

**Lecturer:** Jacobi, Johanna Odilia Angelika

#### **Abstract**

In this seminar, students are introduced to the multi-disciplinary field of political ecology to investigate human-environment relationships in food and agricultural systems.

#### **Objective**

- Being able to provide an overview of the multi-disciplinary field of political ecology for investigating the relationships of humans to our environment
- Learn to identify how power and interest influence social-ecological systems and to distinguish symptoms from systemic root causes
- Become enabled to analyse complex and sometimes distant human-ecology relationships choosing from a broad range of methods

#### **Comment**

Number of participants limited to 25

A motivational application (via moodle, available from July 2022) is required:

- presenting yourself and your studies
- stating what topic in the field of Political Ecology that you are interested in
- suggesting one paper to enrich the literature list for the course

Deadline for the application is 10th September 2022. Selection made until 16th September. Questions regarding the application to [johanna.jacobi@usys.ethz.ch](mailto:johanna.jacobi@usys.ethz.ch).

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=165078&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 751-5201-10L Tropical Cropping Systems, Soils and Livelihoods

**Semester:** 2022W

**Relevant SDGs:** SDG02

**ECTS:** 2

**Lecturer:** Benabderrazik, Kenza; Six, Johan

**Abstract**

This course guides students in analyzing and comprehending tropical agroecosystems. Students gain theoretical knowledge of field methods, diagnostic tools for tropical soils and agroecosystems. Various experts will present their projects and perspectives on various subjects from Food security, Resilience to Soil physics.

**Objective**

Part 1

- (1) Overview of the major land use systems in Tropical agroecosystems in several contexts Africa
- (2) Interdisciplinary analysis of agricultural production systems
- (3) Knowledge on methods to assess Food and energy security in tropical agroecosystems

Part 2

- (4) Hands-on training on the use of field methods, diagnostic tools and survey methods.
- (5) Gain practical knowledge on how to assess Food and Energy Security
- (6) Collaboration in international students and stakeholders

**Comment**

IMPORTANT: Students who enroll for this course are strongly recommended to verify with lecturers

from other courses whether their absence of two weeks may affect their performance in the respective courses.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163839&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 752-3200-00L Sustainable Food Processing

**Semester:** 2022S

**Relevant SDGs:** SDG02

**ECTS:** 3

**Lecturer:** Mathys, Alexander

**Abstract**

This course gives an overview of the holistic approach in sustainable food processing via the consideration of the total value chain. Sustainability assessment as emerging tool in food process development will be introduced.

**Objective**

Understanding of the fundamental knowledge, the interdisciplinary connections and tools of Sustainable Food Processing to enable system oriented thinking, including their need in society and their environmental, economic and social impact. Understanding of food production concepts for biomass and energy use efficiency, significant waste reduction along the food value chain as well as healthy and high quality food production. Awareness of future trends in sustainable food processing.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159028&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 751-4108-00L Innovation in Smart Farming

**Semester:** 2022W

**Relevant SDGs:** SDG02

**ECTS:** 3

**Lecturer:** Walter, Achim

**Abstract**

Die Landwirtschaft ist gefordert, innovative Ansätze zur Erhöhung von Nachhaltigkeit zu nutzen. In

diesem Kurs erkunden Studierende in Gruppenarbeit, wie dies geschehen könnte. Es wird kurze Impulsreferate zu 'Smart Farming' von verschiedenen Experten aus Technik und Entrepreneurship geben. Vor allem erarbeiten die Studierenden eine Idee zur Gründung eines Startup-Unternehmens in diesem Themenfeld

### **Objective**

Im Verlauf des Kurses kreieren die Studierenden neue Ideen zu 'Smart Farming'. Sie erkunden, welche technischen Neuerungen das Potenzial bieten, eine nachhaltigere Landwirtschaft zu realisieren. Sie erkennen das Spannungsfeld von wirtschaftlichen und technischen Möglichkeiten.

### **Comment**

Maximale Teilnehmerzahl: 16.

Ein Motivationsschreiben (maximal 100 Worte) muss nach der ersten Veranstaltung (Montag 26. September) bis am Mittwoch 28. September an Achim Walter (Achim.Walter@usys.ethz.ch) geschickt werden. Die definitive Teilnahme an der Lehrveranstaltung wird den Studierenden am Freitag 30. September mitgeteilt. Die definitive Belegung wird anschliessend vom Studiensekretariat vorgenommen.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=161970&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 751-5000-00L Sustainable Agroecosystems I

**Semester:** 2022S

**Relevant SDGs:** SDG02

**ECTS:** 2

**Lecturer:** Benabderrazik, Kenza; Hartmann, Martin; Six, Johan

### **Abstract**

Welche Faktoren, Prozesse und Interaktionen beeinflussen die Funktionsfähigkeit von Agrarökosystemen? In dieser Lehrveranstaltung mit integrierter Übung und Exkursion werden landwirtschaftliche Verfahren im Hinblick auf eine Förderung der Ressourceneffizienz analysiert, wobei die Verringerung negativer Umweltwirkungen und die Sicherung der sozio-ökonomischen Tragfähigkeit berücksichtigt wird.

### **Objective**

Studierende setzen sich kritisch mit den Konzepten der nachhaltigen Landwirtschaft auseinander.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157986&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# 752-6002-00L Advanced Topics in Nutritional Science

**Semester:** 2022S

**Relevant SDGs:** SDG02

**ECTS:** 3

**Lecturer:** Rigutto, Jessica Mary Rose; Sych, Janice Marie; von Meyenn, Ferdinand

## **Abstract**

The course gives an introduction to selected topics relevant to human nutrition science.

Topics covered include dietary recommendations and nutrient requirements for adults, under- and overnutrition, special dietary patterns including throughout the life stages, the microbiome, fatty acids in nutrition, and nutri-(epi)genomics.

## **Objective**

The course gives a brief introduction into different specialities within human nutrition. The learning objectives of this course are to improve student understanding of:

- 1) dietary recommendations and nutrient requirements at different stages of the life cycle, including pregnancy and lactation, childhood and adolescence, adults and elderly, and for sports persons;
- 2) the influence of undernutrition and overnutrition, as well as specific dietary patterns (e.g. vegetarianism, veganism, fasting, weight loss diets) on health;
- 3) the metabolism of specific nutrients (e.g. vitamins, minerals and fatty acids) and their effect on health;
- 4) nutri-(epi)genomics and the interactions between genes and the environment with respect to nutrition and health;
- 5) the microbiome and its modulation by nutritional factors.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157919&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 751-5005-00L Agroecology and the Transition to Sustainable Food Systems

**Semester:** 2022W

**Relevant SDGs:** SDG02

**ECTS:** 2

**Lecturer:** Grant, Michelle Alison; Sonneveld, Martijn Willem; Ulbrich, Susanne Ernestine

**Abstract**

The aim of this lecture series is to offer students and the interested public a deeper insight into the fundamentals of agroecology and its potential role in transforming food systems. For more information on the public lecture part of this course, please visit: <https://worldfoodsystem.ethz.ch/outreach-and-events/past-events/agroecology-lectures-2021.html>

**Objective**

Students know the elements of agroecology and are able to critically reflect on the important properties as well as benefits and trade-offs of agroecological systems and approaches.

Students are able to understand and explain how the 10 elements could be implemented as guiding principles for policymakers, practitioners and other stakeholders across the food system in planning, managing and evaluating agroecological transitions.

This course enables students and an interested public to engage in a lively and critical debate and to learn about scientific contributions to agroecology. Based on the knowledge gained, students are able to form a personal opinion on the role of agroecology and to reflect on the different facets and real-world applications supporting a transition towards sustainable food systems.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163196&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 751-5510-00L Introduction to Agricultural Robotics

**Semester:** 2022W

**Relevant SDGs:** SDG02

**ECTS:** 3

**Lecturer:** Mintchev, Stefano

**Abstract**

Autonomous robots are quickly becoming a key player in the transition to precision agriculture. In this course, students will learn theoretical and practical aspects of robotics. Lectures will introduce how robots operate and analyse their application to precision agriculture. In hands-on laboratories, students will apply concepts learned in class on educational robots to simulate a weeding task.

**Objective**

After the course, students will be able to critically examine and select appropriate robotic solutions for agricultural applications.

The learning objectives of the course are: (i) illustrate the principle of operation of the main components of a robotic system, (ii) analyse how the different robotic components are integrated and

contribute to the functioning of a robotic system, and (iii) solve problems in the field of agriculture using robotic principles.

**Comment**

Number of participants limited to 30.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163948&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# SDG 3 – Good Health & Wellbeing

## 363-1135-00L Digital Health Project

**Semester:** 2022W

**Relevant SDGs:** SDG03

**ECTS:** 3

**Lecturer:** Kowatsch, Tobias

### **Abstract**

Today, we face the challenge of non-communicable diseases. Personal coaching approaches are neither scalable nor financially sustainable. The question arises therefore to which degree digital health interventions are appropriate to address this challenge. Students will design a just-in-time adaptive intervention.

### **Objective**

The increasing prevalence of non-communicable diseases (NCDs) leads to the important question of how to develop evidence-based digital health interventions (DHIs) that allow medical doctors and other caregivers to scale and tailor long-term treatments to individuals in need at sustainable costs. At the intersection of health economics, information systems research, computer science, and behavioural medicine, this last module of the CAS has the objective to help course participants to understand better the need, design, implementation, and assessment of DHIs, esp. just-in-time adaptive interventions. After the module, participants will be able to understand better the...

1. design of a just-in-time adaptive intervention for the prevention of NCDs
2. technical implementation of a just-in-time adaptive intervention
3. evaluation of a just-in-time adaptive intervention.

### **Comment**

Number of participants limited to 30.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=161982&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 375-0004-00L Designing a Just-in-time Adaptive Intervention (Group Project 3)

**Semester:** 2022W

**Relevant SDGs:** SDG03

**ECTS:** 4

**Lecturer:** Kowatsch, Tobias

### **Abstract**

Today, we face the challenge of chronic conditions. Personal coaching approaches are neither scalable nor financially sustainable. The question arises therefore to which degree Digital Health Interventions (DHIs) are appropriate to address this challenge. In this CAS module, students will design, implement and evaluate a DHI, esp. a just-in-time adaptive intervention.

### **Objective**

After this module, participants will be able to:

1. understand the importance of just-in-time adaptive interventions (JITAs), esp. for the prevention of NCDs
2. understand the design, implementation and evaluation of smartphone-based and chatbot-delivered JITAs
3. discuss opportunities and challenges of JITAs

### **Comment**

Nur für CAS in Digital Health

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164239&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 377-0666-00L This is Public Health

**Semester:** 2022S

**Relevant SDGs:** SDG03

**ECTS:** 1

**Lecturer:** Huisman, Jana Sanne; Künzli, Nino Thomas

### **Abstract**

In dieser Vortrags- und Diskussionsreihe werden wichtige und kontroverse Themen der Gesundheitswissenschaften vorgestellt.

### **Objective**

Die Studierenden können aktuelle Public-Health-Herausforderungen reflektieren und im Lichte von Evidenz und Methoden der Gesundheitswissenschaften diskutieren.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157251&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 752-6151-00L Public Health Concepts

**Semester:** 2022W

**Relevant SDGs:** SDG03

**ECTS:** 3

**Lecturer:** Heusser, Rolf

### **Abstract**

The module "public health concepts" offers an introduction to key principles of public health. Students get acquainted with the concepts and methods of epidemiology. Students also learn to use epidemiological data for prevention and health promotion purposes. Public health concepts and intervention strategies are presented, using examples from infectious and chronic diseases.

### **Objective**

At the end of this module students are able:

- to interpret the results of epidemiological studies
- to critically assess scientific literature
- to know the definition, dimensions and determinants of health
- to plan public health interventions and health promotion projects
- to draw a bridge from evidence to policies and politics

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162739&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

# 227-0981-00L Cross-Disciplinary Research and Development in Medicine and Engineering

**Semester:** 2022W

**Relevant SDGs:** SDG03

**ECTS:** 4

**Lecturer:** Kurtcuoglu, Vartan; Kurtcuoglu, Vartan; Meboldt, Mirko; Meboldt, Mirko; Schmid Daners, Marianne; Schmid Daners, Marianne; Ullrich, Oliver; Ullrich, Oliver; de Julien de Zelicourt, Diane; de Julien de Zelicourt, Diane

## **Abstract**

Cross-disciplinary collaboration between engineers and medical doctors is indispensable for innovation in health care. This course will bring together engineering students from ETH Zurich and medical students from the University of Zurich to experience the rewards and challenges of such interdisciplinary work in a project based learning environment.

## **Objective**

The main goal of this course is to demonstrate the differences in communication between the fields of medicine and engineering. Since such differences become the most evident during actual collaborative work, the course is based on a current project in physiology research that combines medicine and engineering. For the engineering students, the specific aims of the course are to:

- Acquire a working understanding of the anatomy and physiology of the investigated system;
- Identify the engineering challenges in the project and communicate them to the medical students;
- Develop and implement, together with the medical students, solution strategies for the identified challenges;
- Present the found solutions to a cross-disciplinary audience.

## **Comment**

A maximum of 12 medical degree students and 12 (biomedical) engineering degree students can be admitted, their number should be equal.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163453&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 535-0534-00L Drug, Society and Public Health

**Semester:** 2022S

**Relevant SDGs:** SDG03

**ECTS:** 1

**Lecturer:** Heusser, Rolf; Steurer, Johann

**Abstract**

Einführung in die Grundkonzepte und Methoden von Public Health, Epidemiologie und Evidence Based Medicine (EBM). Grundlagen und Prinzipien klinischer Studie zur Überprüfung der Wirksamkeit von Medikamenten.

**Objective**

Die Studierenden kennen die Grundkonzepte und Methoden der Epidemiologie; sie kennen die Grundkonzepte der Evidence Based Medicine (EBM) und wissen, wie nach Evidenz in der Pharmakotherapie zu suchen ist

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158875&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 752-6102-00L The Role of Food and Nutrition for Disease Prevention

**Semester:** 2022S

**Relevant SDGs:** SDG03, SDG02

**ECTS:** 3

**Lecturer:** Andersson, Ingrid Maria

**Abstract**

In this course, different lecturers (responsible and invited) with background in nutrition and/or medicine will teach students about the role of food and nutrition in the etiology and progression of chronic diseases.

**Objective**

In this course, students will develop an understanding for the role of food and nutrition in the maintenance of health, prevention of chronic disease, and progression of chronic diseases at different life-stages.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157908&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

## 752-6202-00L Nutrition Case Studies

**Semester:** 2022S

**Relevant SDGs:** SDG03, SDG02

**ECTS:** 3

**Lecturer:** Rigutto, Jessica Mary Rose

### **Abstract**

In groups, students address real-world case studies focusing on the links between nutrition and health. Each case is being introduced by the lecturer and presented to the class by the respective group, followed by a class discussion facilitated by the group and the lecturer.

### **Objective**

The aim of the course is to improve the students':

- Understanding of the relationships between nutrition/diets and several major diseases/health outcomes.
- Ability to integrate knowledge on diet/nutrition, health/disease and methodologies in nutrition sciences.
- Ability to make evidence-based decisions/recommendations by gathering and analyzing scientific information.
- Communication and problem solving skills, as well as critical thinking ability.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157660&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 865-0069-00L Health and Development - Health Related Aspects of International Development Aid

**Semester:** 2022W

**Relevant SDGs:** SDG03, SDG10

**ECTS:** 2

**Lecturer:** Harttgen, Kenneth

### **Abstract**

Der Kurs greift folgende Themen auf: Grundlagen der Epidemiologie und die globale Verteilung der Krankheitslast, Gesundheitssysteme und die Stärkung von Gesundheitssystemen, übertragbare Krankheiten wie HIV / AIDS, Malaria, Tuberkulose und vernachlässigte Tropenkrankheiten,

Gesundheit von Mutter und Kind, nicht übertragbare Krankheiten und Übergänge in den Bereichen Gesundheit in LAMICs

### **Objective**

Ziel dieses Kurses ist es, einen Überblick über die wichtigsten Themen in Zusammenhang mit Gesundheit und Gesundheitsversorgung in den Ländern mit niedrigem und mittlerem Einkommen (LAMICs) zu vermitteln; wobei das öffentliche Gesundheitswesen im Mittelpunkt steht. Nach dem Kurs sollen die Teilnehmer über ein umfassendes Verständnis für die Herausforderungen in den Bereichen Gesundheitsvorsorge und Gesundheitssysteme in diesen Ländern verfügen. Sie werden in der Lage sein, wichtige globale Themen zu diskutieren wie Übergänge in der Gesundheit, Malaria, vernachlässigte Tropenkrankheiten und HIV / AIDS. Der Kurs gibt einen Einblick in die aktuellen Strategien und Ansätze wichtiger globaler Gesundheitsthemen.

### **Comment**

Nur für MAS in Entwicklung und Zusammenarbeit.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164058&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 376-1122-00L Einführung in Public Health - ausgewählte Themen, besondere Risiken

**Semester:** 2022W

**Relevant SDGs:** SDG03, SDG10

**ECTS:** 2

**Lecturer:** Hämmig, Oliver

### **Abstract**

Neben besonders relevanten Public Health-Themen und grossen sozialen Gesundheitsrisiken werden im Kurs auch die Denk- und Herangehensweise der Multidisziplin Public Health vermittelt. Deren Fokus liegt auch auf Gesundheit und nicht nur Krankheit und mehr auf Prävention statt Kuration sowie auf sozialen Gruppen und deren Lebensbedingungen statt auf Individuen und individuellen Risikofaktoren.

### **Objective**

Die Studierenden lernen wichtige und besonders gesundheitsrelevante Public Health-Themen, Phänomene und Probleme kennen und mit entsprechenden, darauf bezogenen Frage- und Problemstellungen umzugehen.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164679&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

## 376-1220-00L Rehabilitation and Inclusion

**Semester:** 2022W

**Relevant SDGs:** SDG03, SDG10

**ECTS:** 3

**Lecturer:** Riener, Robert

### **Abstract**

This course presents origins and prevention of different physical, sensory, mental impairments, their treatments, and methods of assistance in public and home environments. Rehabilitation is put into a larger context providing insights into healthcare systems, health economy, accessibility, barrier-free architecture, para-sports, legal & regulatory aspects, disability policy, and inclusion.

### **Objective**

With this lecture, we want to not only transfer a broad knowledge about rehabilitation and inclusion, but also raise awareness about the challenges and needs of people with impairments, the economy and the overall society. Students should learn about the complex and multi-faceted interaction of care, treatment, assistance, reimbursement, accessibility, legal regulation, and social inclusion. This knowledge and awareness should be presented in a multi-modal way using interactive tools and organizing group/plenar discussions.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=165838&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 376-1661-00L Ethics of Life Sciences and Biotechnology

**Semester:** 2022W

**Relevant SDGs:** SDG03, SDG10

**ECTS:** 3

**Lecturer:** Blasimme, Alessandro; Vayena, Eftychia

### **Abstract**

This semester course enables students to recognize, anticipate and address ethical issues in the domain of health sciences and their technological application. The students will acquire the necessary theoretical and analytic resources to develop critical thinking skills in the field of applied ethics and will practice how to use such resources to address concrete ethical issues in health sciences



### Objective

This course is tailored to students who want to become familiar with the analysis of ethical issues in all the different domains of life sciences and biotechnology. The course aims at equipping students with the necessary knowledge and analytic skills to understand, discuss and address the ethical aspects of science and technology in the domain of human health. The specific learning objectives of this course are:

- A. Identify ethical issues in in life sciences and biotechnology.
- B. Analyze and critically discuss ethical issues in life sciences and biotechnology.
- C. Become aware of relevant legal and public policy frameworks.
- D. Distinguish different ethical approaches and argumentative strategies in applied ethics.
- E. Recognize how ethical issues relate to different accounts of technology and innovation.
- F. Develop a personal and critical attitude towards the ethical aspects of life sciences and their technological application.
- G. Autonomously anticipate ethical issues.
- H. Propose and communicate solutions to ethical challenges and dilemmas.

### Comment

Number of participants limited to 80

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162201&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 078-0102-00L Core Design and Research Studio II

**Semester:** 2022S

**Relevant SDGs:** SDG03, SDG11

**ECTS:** 17

**Lecturer:** Topalovic, Milica

### Abstract

THE FABRIC OF AGROECOLOGY

A Vision for the Territory of Zurich

The studio aims to research and outline potentials and projects for an agroecological fabric extending across the metropolitan region of Zurich in to contribute to an urgent transdisciplinary and political debate on the transformation of landscapes of food cultivation and their relationships to cities.

## Objective

### WHY AGROECOLOGY? WHY NOW?

We are used to viewing pastoral landscapes, forests and streams, crop fields and meadows as seemingly detached from networks of globally interlinked and expanding urban centres. Stories of urban encroachment on agricultural land still somewhat dramatically depict one way of life replacing another more serene and inert one. In the past, rural imagery was deployed both as a backward antipode to a progressive and modern urban society, and as a bucolic refuge away from machinist industrialisation, urban congestion and squalor. In Switzerland and elsewhere, the urban-rural divide has been a cardinal tool in the political project of building the nation. Switzerland recently chose to sharpen building laws in order to densify inwards and protect the landscape, thereby maintaining its multiple qualities and preserving it from further erosion. A blind spot of this reading of agricultural landscapes is their incessant and accelerating transformation, which both mirror and remain metabolically intertwined with urban growth. What we eat in a city such as Zurich reshapes landscapes of food production near and far. Over the past 150 years the expansion and intensification of industrialised agriculture has resulted in water and natural resource exhaustion, depletion of soil fertility, loss of species and biological diversity, and the locking-in to an unsustainable, globalised food system which consumes more fossil energy than it returns in calories.

In just under a hundred years, over 90% of crop varieties have disappeared because they have not proven adaptive to the expanding mechanical-chemical industrial complex known as the Green Revolution—otherwise known as “conventional farming”. In Switzerland, dozens of local farm animals, fruit tree varieties, cereals, legumes and other vegetables, have become rare species because their yields are lower, or they require more care. This is a great loss for the environment they had adapted to and had contributed to maintaining. The suppression of biodiversity within agriculture has contributed to the creation of isolated “nature areas” and “reserves” reduced to interstitial spaces. Nature reparation and preservation projects have not been able to reverse the adverse effects owing to their reduced land-cover, their fragmented form in the landscape, and incompatibility with the practices of industrial agriculture. In many traditional and indigenous approaches to agriculture, crop fields and pastureland nourishing to humans, were at the same time biologically rich ecotopes. Could we today envision new, or fortify existing agricultural and landscape practices that extend and revitalise the web of life within food production?

This studio proposes an approach in which agricultural territories comprise one intermeshing, living and exchanging whole. Shifting away from anthropocentric frameworks, we will consider agricultural territories as cultivated and cared-for agroecosystems in which non-humans, humans and the environment interact in multiple ways. The studio aims to research and outline potentials and projects for an agroecological fabric extending across the metropolitan region.

## Comment

Only for MAS in Urban and Territorial Design

## VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159472&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# SDG 4 – Quality Education

## 851-0371-00L Coaching Students

**Semester:** 2022W

**Relevant SDGs:** SDG04

### **Abstract**

The course “Coaching Students” enhances Student Teaching Assistants and other participants in their roles as student coaches, acquiring basic knowledge about coaching methodology and the mindset of a coach. The course is focusing on participants that are coaching student groups or teams or individuals with open tasks without model solution, where nondirective support plays an important role.

### **Objective**

Participants will

- understand the basics of coaching and the roles as student coach.
- develop the mindset of a coach and reflect on their attitude towards guiding student learning processes (individuals and teams).
- acquire coaching skills and build knowledge and know-how about coaching methods.
- analyse learning scenarios and team situations by developing and verifying hypotheses.
- design coaching session and feel confident to use coaching methods.
- give and get feedback from peers and self-reflect on their coaching practice.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lereinheit.view?lereinheitId=163874&semkez=2022W&ansicht=LEHRVERANSTALTUNGEN&lang=en>

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## 865-0065-00L VET between Poverty Alleviation and Economic Development

**Semester:** 2022W

**Relevant SDGs:** SDG04, SDG01

**ECTS:** 2

**Lecturer:** Harttgen, Kenneth; Kehl, Franz Anselm Sebastian; Maurer, Markus

### **Abstract**

The course aims at strengthening the capacity in portfolio management for VET, skills development and active labor market policies. It deals with basic issues and challenges of Vocational Education and Training (VET) in Developing Countries. In view of the many of school leavers VET has to place itself between the contradicting intensions of quality education and short-term training interventions.

### **Objective**

The participants are able to

- Assess project proposals and ongoing project regarding their relevance and suitability in the specific country context
- Explain strengths and weaknesses of the opposing approaches "dual apprenticeship" and "competency based training" as well as synergies and incompatibilities between the two
- Describe the competent use of tools currently applied in VET

### **Comment**

Only for MAS/CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation.

ETH doctoral students working on topics related to poverty reduction in low- and middle income countries may also be admitted.

Registration only through the NADEL administration office.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163438&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# SDG 5 – Gender Equality

## 865-0012-00L Gender and Economics

**Semester:** 2022S

**Relevant SDGs:** SDG05

**ECTS:** 2

**Lecturer:** Harttgen, Kenneth

### **Abstract**

This course on gender and economics is intended to provide basic- and intermediate-level training to development practitioners and policy and program staff in international development agencies.

### **Objective**

The overall objective of the course is to strengthen the capacity of technical advisors and program staff on the importance of gender- responsive economic policy. The course conveys basic knowledge about genders aspects in economics. Key elements are:

- Feminist approaches to macroeconomics, microeconomics and international economics
- Critical analysis of global and regional economic trends, including those related to economic crises
- Gender-responsive economic policy for program implementation, policymaking, and advocacy

### **Comment**

Only for MAS/CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation.

ETH doctoral students working on topics related to poverty reduction in low- and middle income countries may also be admitted.

ETH MA/MSc students apply with a letter of motivation to the NADEL administration office.

Registration only through the NADEL administration office.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158711&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# 851-0020-00L Gender and Science

**Semester:** 2022W

**Relevant SDGs:** SDG05

**ECTS:** 2

**Lecturer:** Blaser, Claire Louise; El Kassar, Nadja

## **Abstract**

This lecture series offers an introduction to the relationship between gender and science, with a focus on the specific intersections with the sciences taught at ETH.

## **Objective**

This lecture series is designed to acquaint students from all levels and departments with the various ways in which gender perspectives matter for specific scientific disciplines, as well as for science in general. Students will learn to recognize and analyse the specific ways in which scientific theories and methods are gendered. They will be able to discuss and reflect how these topics are connected to their own scientific disciplines.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163121&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 052-0839-22L Particular Questions in Architectural Theory: Parity in History?

**Semester:** 2022W

**Relevant SDGs:** SDG05

**ECTS:** 2

**Lecturer:** Avermaete, Tom; Hultsch, Annekatriin

## **Abstract**

Can we achieve gender parity in architectural historiography? This course is intended to give students an insight into writing critical histories of architecture, challenging and expanding canons. Based on reading seminars and writing exercises, sessions will focus on questions of gender and parity in architecture while exploring specific case studies from the 18th and 19th centuries.

## **Objective**

Can we achieve gender parity in architectural historiography? Can we talk about equal numbers of women, men, and other gender identities when all textbooks agree that there simply were (much) more male architects than those identifying as female until very recently – and still are, if we accept the star system? What would shift, if we insisted on finding a woman with architectural agency for each man we are taught about? How would we find these women?

In this course, we will explore what forms of agency woman had before 1900, focusing on her pen as her main tool. Writing and publishing allowed woman a public voice long before she was allowed to enrol for professional degrees or have the vote at the ballot box. She was not silent, and she had a lot to say about her environment. Her lived experiences and her skill to ascribe meaning to spaces for others to relive is as crucial to our understanding of architectural history as that of contemporaneous design practices. We must listen to her if we want to come closer to parity in architectural histories. This course will broaden students' understanding of the modern age by challenging existing canons in terms of gender, class, race, and other social categorisations creating systems of oppression.

Consisting of reading seminars and writing exercises, we will engage both with 18th and 19th-century primary sources as well as with feminist theory across the last 300 years, embedding these in the wider contexts to achieve parity. Writing is central to the course, both as primary source as well as a tool to develop our own engagement with architecture and its histories. Students will gain skills in historical research as well as with digital humanities tools. Concepts taught include situated writing, intensive/extensive reading as well as text mining and analysis. Students will be enabled to write their own histories, to take agency themselves in which ways they want to know about the past.

Assignments will consist of several written pieces, produced during the semester, of differing length and format, both creative and academic, always closely linked to our joint research. The pieces will be peer reviewed in class to produce a collaborative response to the question: Can we achieve gender parity in architectural historiography?

#### **Comment**

This course is not offered in HS22.

#### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164470&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 851-0242-11L Gender Issues In Education and STEM

**Semester:** 2022S

**Relevant SDGs:** SDG05, SDG04

**ECTS:** 2

**Lecturer:** Berkowitz Biran, Michal; Braas, Thomas Christiaan; Thurn, Christian Maximilian

#### **Abstract**

In this seminar, we introduce some of the major gender-related issues in the context of education and science learning, such as the under-representation of girls and women in science, technology, engineering and mathematics (STEM). Different perspectives, controversies and empirical evidence will be discussed.

#### **Objective**

- To familiarize students with gender issues in the educational and STEM contexts and with controversies regarding these issues.

- To develop a critical view on existing perspectives.

- To integrate this knowledge with teacher's work.

#### **Comment**

Number of participants limited to 25.

Enrolment only possible with matriculation in Teaching Diploma or Teaching Certificate (excluding Teaching Diploma Sport).

Prerequisite: students should be taking the course 851-0240-00L Human Learning (EW1) in parallel, or to have successfully completed it.

#### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159088&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## Gender Issues In Education and STEM

**Semester:** 2022W

**Relevant SDGs:** SDG05, SDG04

**ECTS:** 2

**Lecturer:** M. Berkowitz Biran, T. Braas, C. M. Thurn

#### **Abstract**

In this seminar, we introduce some of the major gender-related issues in the context of education and science learning, such as the under-representation of girls and women in science, technology, engineering and mathematics (STEM). Common perspectives, controversies and empirical evidence will be discussed.

#### **Objective**

- To familiarize students with gender issues in the educational and STEM context and with controversies regarding these issues
- To develop a critical view on existing research and perspectives.
- To integrate this knowledge with teacher's work.

#### **Comment**

Number of participants limited to 30. Enrolment only possible with matriculation in Teaching Diploma or Teaching Certificate (excluding Teaching Diploma Sport). Prerequisite: students should be taking the course 851-0240-00L Human Learning (EW1) in parallel, or to have successfully completed it.

#### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163708&semkez=2022W&ansicht=KATALOGDATEN&lang=de>



# SDG 6 – Clean Water & Sanitation

## 102-0474-00L Introduction to Water Resources Management

**Semester:** 2022S

**Relevant SDGs:** SDG06

**ECTS:** 4

**Lecturer:** Burlando, Paolo

### **Abstract**

Die Vorlesung gibt eine Einführung in die Analyse und Bewirtschaftung von Wasserressourcen, Wasserbedarf und Wasserdargebot, Speicherbemessung, Aquatische Physik, Wassergüte und Verschmutzung, Schutz und Sanierung von Flüssen, Seen und Grundwasser, nachhaltige und integrale Wasserwirtschaft. Die Veranstaltung wird von einigen Gastvorlesungen ergänzt.

### **Objective**

Einführung in die Wasserwirtschaft auf der Basis der relevanten physikalischen und chemischen Prozesse, Prinzip der Nachhaltigkeit.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158818&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 102-0838-00L Water Supply, Sanitation and Waste Infrastructure and Services in Developing Countries

**Semester:** 2022S

**Relevant SDGs:** SDG06

**ECTS:** 3

**Lecturer:** Zurbrügg, Christian

**Abstract**

Introduction to water supply, excreta, wastewater and solid waste management in developing countries. Highlights links between infrastructure, services and health, resource conservation and environmental protection. New concepts and approaches for sustainable sanitation infrastructure and services for developing countries - especially poor urban areas.

**Objective**

Students receive an introduction to issues of water supply, excreta, waste water and solid waste management in developing countries. They understand the connections between water, wastewater and waste management, health, resource conservation and environmental protection. Besides, they learn how water supply, wastewater and solid waste infrastructure and services can be combined and improved, in order to achieve the development policy goals in terms of disease prevention, resource conservation, and environmental protection.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158345&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 118-0111-00L Sustainability and Water Resources

**Semester:** 2022S

**Relevant SDGs:** SDG06

**ECTS:** 3

**Lecturer:** Burlando, Paolo; Molnar, Darcy Kay

**Abstract**

The block course on Sustainability and Water Resources features invited experts from a range of disciplines, who present their experiences working with sustainability issues related to water resources. The students are exposed to many different perspectives, and learn how to critically evaluate sustainability issues with respect to water resources management.

**Objective**

The course provides the students with background information on sustainability in relation to water resources within an international and multidisciplinary framework. The lectures challenge the students to consider sustainability and the importance of water availability and water scarcity in a changing world, at the same time preparing them to face the challenges of the future, e.g. climate and land use change, increased water use and population growth.

**Comment**

Number of participants limited to 16.===Suitable for MSc and PhD students.

Automatic admittance is given to students of MAS Sustainable Water Resources. All other registrations accepted until capacity is reached.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158421&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 118-0112-00L Participatory and Integrated Water Resources Planning

**Semester:** 2022S

**Relevant SDGs:** SDG06

**ECTS:** 3

**Lecturer:** Castelletti, Andrea

**Abstract**

The course develops basic knowledge and skills for modelling, planning and managing water resources systems in a balanced and sustainable way. The emphasis will be on the operational aspects of water management, including: introduction to participatory decision-making, modelling of the multiple stakes and socio-economic processes, introduction to dynamic and stochastic optimization approaches.

**Objective**

The course aims at illustrating the complex framework of participatory approach in the field of water resources projects, with particular focus on the modelling of the quantitative aspects of the combined dynamics of the physical and socio-economic processes.

**Comment**

Number of participants limited to 25.

The course is complementary to "Water Resources Management" (102-0488-00L).

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158613&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 865-0011-01L Global Water, Sanitation and Waste Management

**Semester:** 2022W

**Relevant SDGs:** SDG06

**ECTS:** 2

**Lecturer:** Günther, Isabel; Tilley, Elizabeth Anne; Zurbrügg, Christian

**Abstract**

Die Lehrveranstaltung bietet einen Überblick über die Zusammenhänge zwischen Siedlungshygiene, Wasserversorgung, Abfallwirtschaft und den Umwelt- und Gesundheitsaspekten. Sie schafft Verständnis für die spezifischen Herausforderungen und möglichen Lösungsansätze bei der Sicherstellung von Umweltdiensten und stellt ihr Einfluss auf die Bevölkerung und Siedlungsgebiete dar.

**Objective**

Die Studierenden können

- die globale Situation und entwicklungspolitischen Trends im Sektor der Siedlungshygiene, Wasserversorgung, Abfallwirtschaft und für ihre wichtigsten Akteure darstellen;
- die Zusammenhänge zwischen Wasserversorgung, Siedlungshygiene und Gesundheit diskutieren;
- die Prinzipien verschiedener Technologien zu Trinkwasseraufbereitung, Fäkal-, Abwasser- und Abfallbewirtschaftung erklären, sowie ihre Stärken und Schwächen abwägen;
- erklären, welche nachhaltigen Konzepte umgesetzt und wie diese in die technischen, institutionellen und gesellschaftlichen Strukturen eingeführt werden können, so dass sie dauerhaft ökonomisch, ökologisch und sozial tragfähig sind;
- Auskunft geben, wo gute fachliche Ressourcen zur Verfügung stehen

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163883&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 118-0101-00L Water Resources Seminars

**Semester:** 2022W

**Relevant SDGs:** SDG06

**ECTS:** 3

**Lecturer:** Burlando, Paolo; Molnar, Darcy Kay

**Abstract**

The Seminar Series features invited experts from a wide range of disciplines who present their experiences working with water related topics in Swiss and international settings. The students are exposed to many different perspectives and are asked to apply the information they learn to specific case studies.

### **Objective**

The Seminar Series provides students with background information on a wide range of topics related to water resources. Invited experts challenge the students to consider water resources and water resource management in new ways, using tools that have been successfully implemented in real case scenarios. The seminars include theory, case studies, and interactive discussions with the experts.

### **Comment**

Number of participants limited to 16.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163377&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 118-0113-00L Water Governance: Challenges and Solutions

**Semester:** 2022S

**Relevant SDGs:** SDG06

**ECTS:** 1

**Lecturer:** Burlando, Paolo; Molnar, Darcy Kay

### **Abstract**

The block course on "Water Governance: Challenges and Solutions" features invited experts with backgrounds in international relations, law, politics, and diplomacy. Through theoretical input and case studies, students learn about the realities of water conflicts and the intricacies of cooperation and diplomacy.

### **Objective**

The course provides students with insights into the complex realities of addressing water conflicts with sustainable solutions that promote cooperation.

### **Comment**

Number of participants limited to 16.

Suitable for MSc and PhD Students. Automatic admittance is given to students of the MAS in Sustainable Water Resources. All other registrations are accepted until capacity is reached.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159228&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# SDG 7 – Affordable & Clean Energy

## 851-0609-06L Governing the Energy Transition

**Semester:** 2022W

**Relevant SDGs:** SDG07

**ECTS:** 2

**Lecturer:** Schmid, Nicolas; Schmidt, Tobias Sebastian Phillip; Sewerin, Sebastian

### **Abstract**

This course addresses the role of policy and its underlying politics in the transformation of the energy sector. It covers historical, socio-economic, and political perspectives and applies various theoretical concepts to understand specific aspects of the governance of the energy transition.

### **Objective**

- To gain an overview of the history of the transition of large technical systems
- To recognize current challenges in the energy system to understand the theoretical frameworks and concepts for studying transitions
- To gain knowledge on the role of policy and politics in energy transitions

### **Comment**

Primarily suited for Master and PhD level.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163029&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 402-0737-00L Energy and Sustainability in the 21st Century (Part I)

**Semester:** 2022W

**Relevant SDGs:** SDG07

**ECTS:** 6

**Lecturer:** Morf, Peter; Morf, Peter

**Objective**

Why is energy important for life and our society?

How did energy use change over time? Which effects did these changes have on the environment?

What are the physical basics of energy technologies?

When, why and how did technology and science of energy come together?

What are the limits and benefits of all the various energy technologies?

How can different energy technologies be compared?

Can we understand the changes in the current energy systems?

How will the energy systems of the future look like?

How fast can we and should we alter the current energy transition?

Which could be the overall guide lines for a working energy system of the future?

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162833&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 857-0103-00L Topics in Public Policy: Governing the Energy Transition

**Semester:** 2022W

**Relevant SDGs:** SDG07

**ECTS:** 8

**Lecturer:** Schmid, Nicolas; Sewerin, Sebastian

**Abstract**

This course addresses the role of policy change and its underlying politics in the transformation of the energy and other climate and sustainability-related sectors. It focuses on political perspectives (while also touching on historical and socio-economic perspectives) and applies various theoretical concepts to understand specific aspects of transition governance.

### Objective

- To gain an overview of the history of the transition of large socio-technical systems
- To recognize challenges for transformative policy change and to understand the theoretical frameworks and concepts for studying transitions
- To develop own research question and address it in research paper that demonstrates knowledge of the role of policy and politics in transitions

### Comment

Only for MA Comparative and International Studies.

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=161971&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 701-0660-00L Praktikum Mensch-Umwelt Systeme

**Semester:** 2022S

**Relevant SDGs:** SDG07

**ECTS:** 7

**Lecturer:** Bresch, David Niklaus; Hanger-Kopp, Susanne; Kropf, Chahan Michael; McCaughey, James Wood

### Abstract

Die Studierenden erarbeiten Forschungsprojekte zum Thema Klimawandelanpassung in welchen sie quantitative und qualitative Methoden zur Datensammlung und Analyse kombinieren und anwenden. Die Studierenden identifizieren politische, ökonomisch, und sozial tragbare Anpassungsmassnahmen und werden so auch die sozialen und ethischen Dimensionen der Klimarisikoanalyse und -anpassung bewerten.

### Objective

Die Studierenden können ein qualitatives und quantitatives Methodenset anwenden, um eine interdisziplinäre Forschungsfrage an der Schnittstelle von Mensch- und Umweltsystemen zu beantworten.

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158703&semkez=2022S&ansicht=KATALOGDATEN&lang=de>



# 151-0221-00L Introduction to Modeling and Optimization of Sustainable Energy Systems

**Semester:** 2022W

**Relevant SDGs:** SDG07

**ECTS:** 4

**Lecturer:** Bardow, André; Sansavini, Giovanni

## **Abstract**

This course introduces the fundamentals of energy system modeling for the analysis and the optimization of the energy system design and operations.

## **Objective**

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

- define and quantify the key performance indicators of sustainable energy systems;
- select and apply appropriate models for conversion, storage and transport of energy;
- develop mathematical models for the analysis, design and operations of multi-energy systems and solve them with appropriate mathematical tools;
- select and apply methodologies for the uncertainty analysis on energy systems models;
- apply the acquired knowledge to tackle the challenges of the energy transition.

In the course "Introduction to Modeling and Optimization of Sustainable Energy Systems", the competencies of process understanding, system understanding, modeling, concept development, data analysis & interpretation and measurement methods are taught, applied and examined. Programming is applied.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164128&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 227-0665-00L Battery Integration Engineering

**Semester:** 2022W

**Relevant SDGs:** SDG07

**ECTS:** 3

**Lecturer:** Patey, Timothy John; Patey, Timothy John

### Abstract

Batteries enable sustainable mobility, renewable power integration, various power grid services, and residential energy storage. Linked with low cost PV, Li-ion batteries are positioned to shift the 19th-century centralized power grid into a 21st-century distributed one. As with battery integration, this course combines understanding of electrochemistry, heat & mass transfer, device engineering.

### Objective

The learning objectives are:

- Apply critical thinking on advancements in battery integration engineering. Assessment reflects this objective and is based on review of a scientific paper, with mark weighting of 10 / 25 / 65 for a proposal / oral presentation / final report, respectively.
- Design battery system concepts for various applications in the modern power system and sustainable mobility, with a deep focus on replacing diesel buses with electric buses combined with charging infrastructure.===- Critically assess progresses in battery integration engineering: from material science of novel battery technologies to battery system design.
- Apply "lessons learned" from the history of batteries to assess progress in battery technology.
- Apply experimental and physical concepts to develop battery models in order to predict lifetime.

### Comment

Priority given to Electrical and Mechanical Engineering students

Students are required to have attended one of the following courses:

- 227-0664-00L Technology and Policy of Electrical Energy Storage
- 529-0440-00L Physical Electrochemistry and Electrocatalysis
- 529-0191-01L Renewable Energy Technologies II, Energy Storage and Conversion
- 529-0659-00L Electrochemistry

(Exception for PhD students).

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163917&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 529-0191-01L Electrochemical Energy Conversion and Storage Technologies

**Semester:** 2022S

**Relevant SDGs:** SDG07

**ECTS:** 4

**Lecturer:** Fabbri, Emiliana; Gubler, Lorenz; Herranz Salañer, Juan

**Abstract**

The course provides an introduction to the principles and applications of electrochemical energy conversion (e.g. fuel cells) and storage (e.g. batteries) technologies in the broader context of a renewable energy system.

**Objective**

Students will discover the importance of electrochemical energy conversion and storage in energy systems of today and the future, specifically in the framework of renewable energy scenarios. Basics and key features of electrochemical devices will be discussed, and applications in the context of the overall energy system will be highlighted with focus on future mobility technologies and grid-scale energy storage. Finally, the role of (electro)chemical processes in power-to-X and deep decarbonization concepts will be elaborated.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158544&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 227-0664-00L Technology and Policy of Electrical Energy Storage

**Semester:** 2022S

**Relevant SDGs:** SDG07

**ECTS:** 3

**Lecturer:** Schmidt, Tobias Sebastian Phillip; Wood, Vanessa Claire

**Abstract**

With the global emphasis on decreasing CO<sub>2</sub> emissions, achieving fossil fuel independence and growing the use of renewables, developing & implementing energy storage solutions for electric mobility & grid stabilization represent a key technology & policy challenge. This course uses lithium ion batteries as a case study to understand the interplay between technology, economics, and policy.

**Objective**

The students will learn of the complexity involved in battery research, design, production, as well as in investment, economics and policy making around batteries. Students from technical disciplines will gain insights into policy, while students from social science backgrounds will gain insights into technology.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158943&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# 151-0966-00L Introduction to Quantum Mechanics for Engineers

**Semester:** 2022S

**Relevant SDGs:** SDG07

**ECTS:** 4

**Lecturer:** Norris, David James; Norris, David James

## **Abstract**

This course provides fundamental knowledge in the principles of quantum mechanics and connects it to applications in engineering.

## **Objective**

To work effectively in many areas of modern engineering, such as renewable energy and nanotechnology, students must possess a basic understanding of quantum mechanics. The aim of this course is to provide this knowledge while making connections to applications of relevancy to engineers. After completing this course, students will understand the basic postulates of quantum mechanics and be able to apply mathematical methods for solving various problems including atoms, molecules, and solids. Additional examples from engineering disciplines will also be integrated.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158717&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 701-0967-00L Projektentwicklung im Bereich erneuerbarer Energien

**Semester:** 2022W

**Relevant SDGs:** SDG07

**ECTS:** 2

**Lecturer:** Appenzeller, Caspar Andreas; Rechsteiner, Rudolf

## **Abstract**

Umsetzung von Projekten im Geschäftsfeld der erneuerbaren Energien, Analyse der gesetzlichen Rahmenbedingungen und der Geschäftsrisiken.

Sie lernen Geschäftsmodelle von Investoren in den Technikfeldern Windenergie, Wasserkraft und Solarenergie kennen.

Gruppenübungen anhand von Beispielen mit konkreten Projekten von erfahrenen Experten.

### Objective

Sie erhalten eine praxisorientierte Einführung in die regulativen, rechtlichen und betriebswirtschaftlichen Anforderungen an erneuerbare-Energien-Projekte. Aufgezeigt werden auch die Möglichkeiten der Integration von fluktuierender Energieproduktion im Umfeld volatiler Preise. Übungen anhand von konkreten Projekt-Beispielen in Gruppen

Sie erkennen die Chancen und Risiken neuer Projekte und entwickeln Strategien zur Absicherung.

### Comment

Die Teilnehmerzahl ist auf 30 Studierende beschränkt.

Die Warteliste wird am 05.10.2022 gelöscht.

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163456&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 227-0330-00L Energy-Efficient Analog Circuits for IoT Systems

**Semester:** 2022S

**Relevant SDGs:** SDG07, SDG09

**ECTS:** 6

**Lecturer:** Jang, Taekwang; Jang, Taekwang

### Abstract

We are facing a new era of the Internet of things, similarly indicated as Industry 4.0, TSensors, Ubiquitous or The Fog. A miniaturized computer is the key to this innovation that senses, collects and processes information from objects. In this class, based on the recent publications, energy efficient analog IC techniques will be introduced which is the main challenge to reduce the battery size.

### Objective

This class introduces key analog building blocks such as energy harvester, frequency generator, data converter, sensor interface, power converter based on the recent publications for IoT systems including wearable electronics, bio-implantable devices, and environmental sensors.

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159280&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

## 063-0655-22L Subject Semester HS22 (Fachsemester) in the Field of Technology in Architecture (ITA, Prof. Schlüter)

**Semester:** 2022W

**Relevant SDGs:** SDG07, SDG09

**ECTS:** 14

**Lecturer:** Schlüter, Arno

### **Abstract**

In this research semester, we address the topic of Zero Emissions Building Design, which integrates aspects of energy, materials and technology, human behaviour and comfort into architectural design, aspiring synergetic design solutions.

### **Objective**

After successfully concluding the research semester students can identify concepts and relevant design parameters for Zero Emissions Building Design and develop integrated architectural design strategies. They know how to select and use appropriate simulation and analysis tools to qualify and quantify their design solutions and visualize their concepts using both technical schematics as well as architectural drawings and visualizations.

### **Comment**

A student can only register once for a "Fachsemester" during the Master studies!

The application deadline for this "Fachsemester" is September 7, 8 p.m. You will receive a message about acceptance or rejection for the subject semester by September 9, 2 p.m. at the latest. Students who have been rejected have the opportunity to choose a design class.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164539&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 151-0076-11L SOWA (Solar Water) – Drinking Water from Saline and Brackish Water Using Solar Energy

**Semester:** 2022S

**Relevant SDGs:** SDG07, SDG09

**ECTS:** 14

**Lecturer:** Mazzotti, Marco

### **Abstract**

Im Team ein Produkt von A-Z entwickeln und realisieren! Anwenden und Vertiefen des bestehenden Wissens, Arbeiten in Teams, Selbständigkeit, Problemstrukturierung, Lösungsfindung in unscharfen Problemstellungen, Systembeschreibung und -simulation, Präsentation und Dokumentation, Realisationsfähigkeit, Werkstatt- und Industriekontakte, Anwendung modernster Ingenieur-Werkzeuge (Matlab, Simulink usw).

### **Objective**

Die vielfältigen Lernziele dieses Fokus-Projektes sind:

- Synthetisieren und Vertiefen des theoretischen Wissens aus den Grundlagenfächern des 1.-4. Semesters
- Teamorganisation, Arbeiten in Teams, Steigerung der sozialen Kompetenz
- Selbständigkeit, Initiative, selbständiges Lernen neuer Themeninhalte
- Problemstrukturierung, Lösungsfindung in unscharfen Problemstellungen, Suchen von Informationen
- Systembeschreibung und -simulation
- Präsentationstechnik, Dokumentationserstellung
- Entscheidungsfähigkeit, Realisationsfähigkeit
- Werkstatt- und Industriekontakte
- Erweiterung und Vertiefung von Sachwissen
- Beherrschung modernster Ingenieur-Werkzeuge (Matlab, Simulink, CAD, CAE, PDM)

### **Comment**

Voraussetzung: Besuch der Lerneinheit 151-0076-10L SOWA (Solar Water) – Drinking Water from Saline and Brackish Water Using Solar Energy im HS21.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159733&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 151-2057-00L Modeling and Optimization of Energy Systems (EPFL)

**Semester:** 2022W

**Relevant SDGs:** SDG07, SDG09

**ECTS:** 4

**Lecturer:** external organisers

### **Abstract**

The goal of the lecture is to present and apply techniques for the modelling and the thermo-economic optimisation of industrial process and energy systems. The lecture covers the problem statement, the solving methods for the simulation and the single and multi-objective optimisation problems.

### **Objective**

By the end of the course, the student must be able to:

- Master the concepts of thermodynamic efficiency, E6
- Establish the flow diagram of an industrial process and calculate the corresponding energy and mass balance, E22
- Analyse the energy and exergy efficiency of industrial energy systems, E23
- Model, design and optimize energy conversion systems and industrial processes, E24
- Establish the flow diagram of an industrial process and calculate the corresponding energy and mass balance, E20
- Explain and apply the concepts of thermodynamic efficiency, E6
- Analyze the energy and exergy efficiency of industrial energy systems, E21
- Model , design and optimize energy conversion systems and industrial processes, E22

### **Comment**

No enrolment to this course at ETH Zurich. Book the corresponding module directly at EPFL.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=165240&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# SDG 8 – Decent Work & Economic Growth

## 363-0532-00L Ökonomische Theorie der Nachhaltigkeit

**Semester:** 2022S

**Relevant SDGs:** SDG08

**ECTS:** 3

**Lecturer:** Bretschger, Lucas

### **Abstract**

Konzepte und Indikatoren nachhaltiger Entwicklung, Paradigmen starker und schwacher Nachhaltigkeit; Modelle des neoklassischen und des endogenen Wachstums; Wirtschaftswachstum bei nicht-erneuerbaren und erneuerbaren Ressourcen; Umweltverschmutzung, Umweltpolitik und Wachstum; Rolle der Substitution und des technischen Fortschritts; Environmental Kuznets Curve; Nachhaltigkeitspolitik

### **Objective**

Die Studierenden sollen ein wissenschaftliches Verständnis für die Implikationen nachhaltiger Entwicklung in Bezug auf das langfristige Wachstum von Volkswirtschaften entwickeln. Es soll herausgearbeitet werden, inwieweit das Potential für ein nachhaltiges Wachstum von Substitutionsmöglichkeiten, technologischem Fortschritt und umweltpolitischen Eingriffen des Staates abhängig ist.

Nach einem erfolgreichen Abschluss dieses Kurses sind die Studierenden in der Lage:

1. die Ursachen der langfristigen Entwicklung von Wirtschaften zu verstehen
2. den Einfluss von natürlichen Ressourcen und von Umweltverschmutzung auf die Entwicklung der gesellschaftlichen Wohlfahrt zu analysieren
3. die Rolle der Politik für die Verfolgung der Nachhaltigkeitsziele zweckmässig einzuordnen.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158726&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# 851-0602-00L Shaping a DCent.Society: Assessing Societal Implications of Bitcoin, Blockchains & Smart Contracts

**Semester:** 2022S

**Relevant SDGs:** SDG08

**ECTS:** 3

**Lecturer:** Dapp, Marcus Manfred

## **Abstract**

The course investigates the potential long-term implications of distributed ledger technology on our societies. Students critically reflect the economic, political, ecological, and ethical implications of the Bitcoin cryptocurrency and the Ethereum smart contract engine (incl. DeFi) by exploring connections to disciplines such as economics, political science, psychology, sociology, and philosophy.

## **Objective**

Compare the paradigm shift from Web 2.0 to Web 3.0

Distinguish a broad range of Web 3.0 concepts

Hypothesize about economic, political, ecological, and ethical implications of Bitcoin, Ethereum, and decentralized applications

Integrate ethical and governance considerations into the design of cryptoeconomic systems

Justify own opinions about societal implications of decentralizing society

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159548&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 364-0576-00L Advanced Sustainability Economics

**Semester:** 2022S

**Relevant SDGs:** SDG08

**ECTS:** 3

**Lecturer:** Bretschger, Lucas; Komarov, Evgenij

## **Abstract**

The course covers current resource and sustainability economics, including ethical foundations of

sustainability, intertemporal optimisation in capital-resource economies, sustainable use of non-renewable and renewable resources, pollution dynamics, population growth, and sectoral heterogeneity. A final part is on empirical contributions, e.g. the resource curse, energy prices, and the EKC.

**Objective**

Understanding of the current issues and economic methods in sustainability research; ability to solve typical problems like the calculation of the growth rate under environmental restriction with the help of appropriate model equations.

**Comment**

PhD course, open for MSc students

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158704&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 363-1159-00L Labor Economics

**Semester:** 2022W

**Relevant SDGs:** SDG08

**ECTS:** 3

**Lecturer:** Kopp, Daniel; Siegenthaler, Michael

**Abstract**

The lecture provides an introduction to some of the central issues in labor economics, including the determinants of labor supply, firms' demand for workers, minimum wages, unemployment, wage inequality, immigration, and labor market discrimination. It presents recent empirical research papers on these issues and discusses the empirical challenges related to their research designs.

**Objective**

After taking this course, students will be able to

- analyze the behavior of actors in the labor market within the conceptual framework of economic theory.
- explain phenomena such as unemployment, wage inequality, labor market discrimination, and labor market imperfections.
- comment on policy-relevant issues such as minimum wages, a universal basic income, immigration, and unemployment insurance.
- comprehend and present the results of the relevant empirical studies on these issues.
- understand the challenges associated with a causal identification of research questions in the social sciences.

- comprehend the idea behind important statistical methods that modern empirical researchers apply to overcome these challenges.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162090&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 364-1168-00L Economics of Inequality

**Semester:** 2022W

**Relevant SDGs:** SDG08

**ECTS:** 3

**Lecturer:** Martinez, Isabel Zenaida

**Abstract**

We discuss research on inequality in different areas of economics. Possible topics include distributional national accounts, heterogeneous returns, inheritances, intergenerational mobility, gender inequality in the labor market (topics will also be decided upon depending on the students' interests). Students will present a paper and critically comment on it (as if they would referee the paper).

**Objective**

After the course, participants will have a solid understanding of the current state of research on inequality in different fields in economics and, starting from there, will be able to develop their own research ideas. They will further learn how to critically assess and referee a paper, as it is common practice during the referee process, and they will practice their presentation skills and give feedback to each other. The students will therefore also acquire competences for conferences and participation in the scientific discourse.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=165279&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 851-0093-00L Grundprobleme der Wirtschaftsethik

**Semester:** 2022W

**Relevant SDGs:** SDG08

**ECTS:** 3

**Lecturer:** Wingert, Lutz

### **Abstract**

Ökologische Krisen und große soziale Ungleichheiten provozieren die Frage: Ist unsere Art des globalen Wirtschaftens vernünftig? - Wann ist Reichtum moralisch stoßend? Müssen wir für den Umweltschutz auf Wirtschaftswachstum verzichten? Sind Technologien, z.B. KI-basierte Designs von Märkten für öffentliche Güter, die Lösung oder braucht es einen Einstellungswandel zur Lösung solcher Probleme?

### **Objective**

Die Teilnehmer sollen Antworten auf folgende Fragen kennenlernen und befähigt werden, die Rationalität der Antworten zu beurteilen:

1. Wie sehr ist wirtschaftlicher Erfolg und Wohlstand ein individuelles Verdienst und wie sehr Glück? Und was folgt aus der Antwort für die Bewertung von sozialer Ungleichheit?
2. Wann ist genug an Konsum und Wachstum genug?
3. Was sind Kollektivgüter („commons“), die nicht privatisiert werden sollen?
4. Wofür sollen Konsumenten und Unternehmer verantwortlich sein?
5. Ist eine „sharing economy“ ein Mittel für verantwortlicheres Wirtschaften?
6. Können Technologien zur Produktion und Allokation von Ressourcen und für den kontrollierten Konsum von Gütern die Probleme der sozialen Ungleichheit, des Schutzes von Ökosystemen und der Verantwortung von Produzenten, Investorinnen und Konsumenten lösen?
7. Was ist gut und was ist schlecht am globalen kapitalistischen Schema des Wirtschaftens im 21. Jahrhundert?
8. Braucht es eine wirtschaftliche Deglobalisierung?

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164644&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 363-1029-00L Sustainability & Financial Markets

**Semester:** 2022S

**Relevant SDGs:** SDG08

**ECTS:** 2

**Lecturer:** Busch, Timo Oliver

### **Abstract**

Sustainable investments are becoming increasingly prominent while at the same time current business practices reach beyond ecological limits. Are sustainable investments a myth? Clearly not; however,

sustainable investment practices still have to move on. This lecture is focused on the related challenges and discusses ways how the field of sustainable investments could become more effective.

### **Objective**

Sustainable investments are becoming increasingly prominent while at the same time the market reality remains unchanged despite evidence that current business practices reach beyond ecological limits and are in breach of both the inter-generational and intra-generational equity. Are sustainable investments a myth? Clearly not - capital markets could indeed play a central role in overcoming this dilemma. However, sustainable investment practices still have to move on for effectively incorporating and promoting sustainability. For this to occur, two central challenges need to be addressed: In order to improve the authenticity of data, it is important to make clear what environmental, social, and governance (ESG) related data is actually measuring. This, in turn, will contribute to ensuring that investors gain trust in ESG-criteria and investments. In order to overcome the prevailing focus on short-term profit maximization, it is necessary to put more emphasis on a systems-perspective. This, in turn, will help investors to move on from having a too narrow ceteris paribus perspective towards addressing risks and opportunities within changing ecological and human-social systems. The learning objectives of this lecture is to understand these two challenges in detail and discusses ways how the field of sustainable investments could move ahead.

### **Comment**

Limited number of participants. Credit points will be awarded for attending all course days.  
Prerequisites: Basic understanding of corporate sustainability (see lecture Prof. Hoffmann, autumn semester) and interest in financial markets and investments.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157946&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 363-1132-00L Business Models for a Circular Economy

**Semester:** 2022S

**Relevant SDGs:** SDG08

**ECTS:** 3

**Lecturer:** Bening-Bach, Catharina Rebecca; Blum, Nicola Ursina

### **Abstract**

This course leads students through the process of re-thinking an existing product in a circular way. At the end of the course students will come up with new, circular business models for their products. The course consists of an overview of circular economy principles, research, diverse workshop formats and team work.

### **Objective**

- 1) Students familiarize themselves with the principles of a circular economy
- 2) Students critically reflect on the limits of a circular economy

3) Students experience a re-thinking process of an existing product along circular economy principles

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157202&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 701-0758-00L Ökologische Ökonomik: Grundlagen und Wachstumskritik

**Semester:** 2022S

**Relevant SDGs:** SDG08

**ECTS:** 2

**Lecturer:** Seidl, Irmi

**Abstract**

Die Studierenden lernen die Grundlagen, zentralen Fragestellungen, Analysen der Ökologischen Ökonomik kennen. Im Zentrum steht dabei das Thema Wirtschaftswachstum. Welche Positionen hat die Ökologische Ökonomik dazu? Mit welchen Theorien und Konzepten begründet sie dies insgesamt und in einzelnen ökonomischen Teilbereichen (z.B. Ressourcenverbrauch, Konsum, Arbeitsmarkt, Unternehmen)?

**Objective**

Kennenlernen der Grundlagen und zentralen Fragestellungen der Ökologischen Ökonomik (ÖÖ): z.B. 'pre-analytic vision', Gegenstandsbereich, Entstehung ÖÖ, Beiträge involvierter Disziplinen wie Ökologie oder Politologie, ökologisch-ökonomische Analyse von Themen wie Arbeitsmarkt, Konsum oder Geld. Kritische Analyse von Wachstum und Kennenlernen von Ansätzen zur Reduktion von Wachstumszwängen.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157156&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 701-0764-00L Kritische Auseinandersetzung mit dem ökonomischen Wachstumsparadigma

**Semester:** 2022S

**Relevant SDGs:** SDG08

**ECTS:** 1

**Lecturer:** Seidl, Irmi

**Abstract**

In diesem Seminar werden etwa drei wissenschaftliche Texte gelesen und diskutiert, die sich eingehend und kritisch mit Wirtschaftswachstum und der Umweltthematik beschäftigen.

**Objective**

Vertiefte Kenntnis der ökologischen Ökonomik, der ökonomisch-ökologischen Wachstumskritik, der energetisch-materiellen Implikationen von Wachstum, von Konsumkritik und wachstumskritischen Denktraditionen.

Lesen und Reflexion wissenschaftlicher Texte.

**Comment**

Maximale Teilnehmerzahl: 25

Zielgruppen: Agrarwissenschaften (BSc/MSc) und Umweltnaturwissenschaften (BSc/MSc).

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159014&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 865-0006-00L Leveraging Private Impact Investors in Development Cooperation

**Semester:** 2022S

**Relevant SDGs:** SDG08

**ECTS:** 1

**Lecturer:** Humphrey, Christopher Strong

**Abstract**

This two-day course demystifies impact investing for people working in development cooperation. The course provides an introduction to understanding the terminology and instruments involved in impact investing and evaluating opportunities and trade-offs for development.

**Objective**

This two-day course demystifies impact investing for people working in development cooperation. Impact investing—the idea that it is possible to “do good” as well as make money with certain types of investment—is changing the landscape of development cooperation. Impact investing is growing rapidly and development agencies and non-governmental organizations increasingly seek to leverage private investor resources. But many development actors are not accustomed to working with private investors, and are uneasy about their profit motivation and modes of operation. The course provides an introduction to the terminology and instruments involved in impact investing and evaluates developmental opportunities and trade-offs.



### Comment

Only for MAS/CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation.

Doctoral students dealing with empirical research in the area of development and cooperation (EZA) may be admitted "sur Dossier".

Registration only through the NADEL administration office.

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159829&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 363-1048-00L Sustainable Supply Chain Management

**Semester:** 2022S

**Relevant SDGs:** SDG08, SDG09

**ECTS:** 3

**Lecturer:** Schmidt, Christoph Georg; Wagner, Stephan Mathias

### Abstract

Sustainability risks are inherent in supply chain operations. The negative impact on society, the environment and individuals can be substantial. This course will provide students with contemporary knowledge on supply chain sustainability risks as well as practices to mitigate such risks and manage supply chains more sustainably.

### Objective

Having successfully completed the course, students will demonstrate an understanding of the theory and practice of supply chain sustainability risks as well as the sustainable management of global supply chains. In particular:

1. Understand and communicate the role and importance of sustainability in modern global supply chains.
2. Describe and compare different established and emerging practices, frameworks and theories on sustainable supply chain management, and their relation to corporate strategy.
3. Identify and assess the challenges and trade-offs associated with introducing sustainability considerations to supply chain management.
4. Evaluate and apply the appropriate tools and methods to provide structured solutions to the novel challenges, as well as manage change across different stakeholder groups.
5. Discover the role of technology in developing and facilitating sustainable supply chains and discuss current developments and trends.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=160698&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 363-0552-00L Economic Growth and Resource Use

**Semester:** 2022S

**Relevant SDGs:** SDG08, SDG12

**ECTS:** 3

**Lecturer:** Komarov, Evgenij

**Abstract**

The course deals with the factors that contribute to economic development. Throughout the course theoretical economic modelling will be used to discuss the effects of factors – such as land, human/physical capital, technology, fossil energy resources, and climate change – on economic growth and to draw conclusions for the future.

**Objective**

The general objective of the course is to provide students tools and intuition to:

- i) think in a structured way – though economic modelling – about the factors that have led to the different growth experiences among countries, and still shape our contemporary situation;
- ii) assess and design policies on the basis of economic development;
- iii) draw conclusions for the future of economic development, that take into account prevalent issues such as the scarcity of fossil energy resources and climate change.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158599&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 363-0537-00L Resource and Environmental Economics

**Semester:** 2022W

**Relevant SDGs:** SDG08, SDG12, SDG13

**ECTS:** 3

**Lecturer:** Bretschger, Lucas

**Abstract**

Relationship between economy and environment, market failures, external effects and public goods, contingent valuation, internalisation of externalities, economics of non-renewable resources, economics of renewable resources, environmental cost-benefit analysis, sustainability economics, and international resource and environmental problems.

**Objective**

A successful completion of the course will enable a thorough understanding of the basic questions and methods of resource and environmental economics and the ability to solve typical problems using appropriate tools consisting of concise verbal explanations, diagrams or mathematical expressions. Concrete goals are first of all the acquisition of knowledge about the main questions of resource and environmental economics and about the foundation of the theory with different normative concepts in terms of efficiency and fairness. Secondly, students should be able to deal with environmental externalities and internalisation through appropriate policies or private negotiations, including knowledge of the available policy instruments and their relative strengths and weaknesses. Thirdly, the course will allow for in-depth economic analysis of renewable and non-renewable resources, including the role of stock constraints, regeneration functions, market power, property rights and the impact of technology. A fourth objective is to successfully use the well-known tool of cost-benefit analysis for environmental policy problems, which requires knowledge of the benefits of an improved natural environment. The last two objectives of the course are the acquisition of sufficient knowledge about the economics of sustainability and the application of environmental economic theory and policy at international level, e.g. to the problem of climate change.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163099&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 363-1038-00L Sustainability Start-Up Seminar

**Semester:** 2022S

**Relevant SDGs:** SDG08, SDG13, SDG12

**ECTS:** 3

**Lecturer:** Sägesser, Anaïs Hannah

**Abstract**

Participants are lead through a venturing process inspired by Lean and Design Thinking and social innovation methodologies. The course contains problem identification, idea generation and evaluation, team formation, and the development of one entrepreneurial idea per team. Starting points for entrepreneurial ideas are the climate crisis and biodiversity loss.

**Objective**

1. Students have experienced and know how to take the first steps towards co-creating a venture and potentially company

2. Students reflect deeply on sustainability issues (with a focus on climate change & biodiversity) and can formulate a problem statement
3. Students believe in their ability to bring change to the world with their own ideas
4. Students are able to apply entrepreneurial practices such as e.g. the lean startup approach
5. Students have built a first network and know how to proceed and who to approach in case they would like to take their ventures further.

**Comment**

Number of participants limited to 30.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158135&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# SDG 9 – Industry, Innovation & Infrastructure

## 118-0114-00L Nature-Based Solutions and Blue Green Infrastructure

**Semester:** 2022W

**Relevant SDGs:** SDG09

**ECTS:** 3

**Lecturer:** Bach, Peter Marcus; Molnar, Darcy Kay

### **Abstract**

Nature-based solutions (NbS) are effective means of addressing global societal challenges such as the need for water and food security, disaster risk reduction, and adaptation to climate change. Students are exposed to a variety of topics around NbS and Blue Green Infrastructure, gaining insight into how societies can incorporate ecosystem-based solutions to become more resilient and sustainable.

### **Objective**

Nature-based solutions leverage water resources management to not only provide basic water servicing needs, but also a range of ecosystem services for the benefits of humans and the environment. At the urban and peri-urban level, multi-functional Blue Green Infrastructure solutions (inspired by nature-based concepts) are being developed that involve a broad range of stakeholders and a complex policy environment.

The course will provide students with an overarching picture of how Nature-based solutions and Blue Green infrastructure are being used to make societies and cities greener, more resilient, climate-adaptive, more liveable, sustainable, and especially, how water resources management is being leveraged to accomplish this. Students will gain insight into suitable tools and approaches to navigating interactions between relevant stakeholders, hands-on experience through a scenario-based real-world project, a field visit to an urban case study, as well as insights from leading public and private sector experts in Nature-based Solutions and Blue Green Infrastructure.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162129&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

# 363-1076-00L Diffusion of Clean Technologies

**Semester:** 2022S

**Relevant SDGs:** SDG09

**ECTS:** 3

**Lecturer:** Girod, Bastien Vincent Samuel; Knöri, Christof

## **Abstract**

How can the diffusion clean technologies be accelerated?

Participants learn to apply analytic tools to understand environmental and business potentials of clean technologies. Exercises that evaluate a clean technology selected by the student themselves deepen the theoretical knowledge gained. Students are trained to evaluate, explain and pitch a clean technology.

## **Objective**

After completing this course: ...

- 1) Students are able to apply the theoretical concepts explaining the performance and diffusion of clean technologies\*
- 2) Students can determine key drivers and barriers (economic, environmental, technological, regulatory) for the diffusion of clean technologies\*
- 3) Students know how to quantitatively model key characteristics or dynamics of selected clean technologies\*
- 4) Students are prepared to convincingly present a selected clean technology\* to a business or policy audience

\*In 2021 we will focus on the 1000+ solutions to protect the environment identified by <https://solarimpulse.com>. Accordingly we will also invite a guest speaker from Solar Impulse Foundation and students will contribute to the assessment of these solutions.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159138&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 052-1130-22L Entwurf V-IX: Landschaftsinfrastrukturen - Starke Formen (GD Menn)

**Semester:** 2022S

**Relevant SDGs:** SDG09

**ECTS:** 14

**Lecturer:** Menn, Corina

### **Abstract**

Von unserer territorialen Recherche im Bergell und der Beschäftigung mit Prozess und Maschine im letzten Semester, verschieben wir die Betrachtung auf Energie-Infrastrukturen in der alpinen Landschaft. Sie interessieren uns materiell und kulturell als einschneidende und dauerhaft angelegte Form-Konstanten in der Landschaft und architektonisch als Modelle entwerflicher Prinzipien.

### **Objective**

Wir möchten aus Infrastrukturbauwerken „lernen“ und uns im Erfassen und entwerflichen Übersetzen von strukturellen Merkmalen und Prinzipien in einen architektonischen Entwurf üben. Die Verknüpfung mit aktuellen Fragestellungen von Energiepolitik, Wasserkraft und dem Wandel der alpinen Landschaft vermittelt ein übergeordnetes Denken in Systemen. Wir eignen uns an, im Rahmen des Themas kritisch eine Haltung einzunehmen, diese entwerferisch auszudrücken und ein kohärentes Projekt zu entwickeln.

### **Comment**

Die Belegung unter [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch) ist erst nach der Zuteilung der Entwurfsklasse am Schluss der internen Einschreibung am D-ARCH möglich (<http://www.einschreibung.arch.ethz.ch/design.php>).

Eine Benotung des Entwurfs am Semesterende erfolgt ausschliesslich aufgrund der per Stichtag, 1.4.22, 24:00 Uhr, dokumentierten Belegungsliste. Das vorgenannte Datum ist der letzte Termin zum Löschen oder Belegen dieser Lehrveranstaltung!

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159633&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 052-0542-22L Entwurf IV: Raum der Akkumulation (Christ/Gantenbein)

**Semester:** 2022S

**Relevant SDGs:** SDG09

**ECTS:** 14

**Lecturer:** Christ, Franz Emanuel; De Vylder, Jan Albert Emilie; Gantenbein, Christoph; Mettler, Daniel Heinrich; Studer, Daniel

**Abstract**

Wie sieht der Lagerhaus von morgen aus? Entwurf eines Projekts in vier Schritten:

1. Entwickeln von Visionen, Szenarien zur Zukunft des Lagerns.
2. Entwurf eines räumlichen Systems zum Szenario.
3. Übersetzen des Systems in eine architektonische Struktur aus recycelten Bauteilen.
4. Ausarbeiten des realen Projekts.

**Objective**

Entwickeln einer eigenständigen, verantwortungsvollen und visionären Haltung zu einer aktuellen gesellschaftlichen Fragestellung mit dem Medium der (Plan-)Collagen. Fähigkeit, (architektur-) theoretische Texte kritisch zu lesen, zu diskutieren und zur Fragestellung in Beziehung zu setzen. Entwickeln eines städtebaulich, typologisch, formal kohärenten eigenständigen Projekts, das sich mit dem Thema des Wiederverwendens konstruktiv auseinandersetzt und primär mittels Modellen dargestellt wird.

**Comment**

Die Belegung unter myStudies ist erst nach der Zuteilung der Entwurfsklasse am Schluss der internen Einschreibung am D-ARCH möglich (s. <http://www.einschreibung.arch.ethz.ch/design.php>).

Studierende, welche die Entwurfsklasse nicht wechseln möchten, müssen an der internen Einschreibung nicht teilnehmen.

Eine Benotung des Entwurfs am Semesterende erfolgt ausschliesslich aufgrund der per Stichtag, 1.4.22, 24:00 Uhr, dokumentierten Belegungsliste. Das vorgenannte Datum ist der letzte Termin zum Löschen oder Belegen dieser Lehrveranstaltung!

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159647&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 851-0732-06L Law & Tech

**Semester:** 2022W

**Relevant SDGs:** SDG09

**ECTS:** 3

**Lecturer:** Merane, Jakob; Nielsen, Aileen Ann; Stremitzer, Alexander

**Abstract**

The course will give an overview of major areas of law that affect the regulation of technology and will also discuss how new technologies might revolutionize the administration of justice itself. Guest lectures will cast light on near-future technologies and the challenges they are likely to face or create from a regulatory standpoint.



### Objective

Students learn to appreciate the regulatory challenges posed by state-of-the-art technologies, ranging from autonomous vehicles to consumer-facing DNA technologies. They will also learn how new technologies might influence the operations of justice and regulation.

The objective is for engineering students to learn how to navigate the regulatory landscape, and to participate in social discussion about economic, ethical and legal aspects of technology.

The course is open to ETH students through the Science in Perspective program of the Department of Humanities, Social and Political Sciences.

### Comment

Any students enrolling in the course must complete a short writing assignment within two weeks of registering. Please contact the instructors via email ([aileen.nielsen@gess.ethz.ch](mailto:aileen.nielsen@gess.ethz.ch)) for information about the assignment and for access to the course Slack workspace.

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162068&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 052-1150-22L Entwurf V-IX: Wiederverwendung... selon arrivage (GD Buser)

**Semester:** 2022S

**Relevant SDGs:** SDG09

**ECTS:** 14

**Lecturer:** Buser, Barbara Johanna

### Abstract

Der Entwurfsprozess wird auf den Kopf gestellt!

Neben der praktischen Arbeit wird von hochmotivierten ReferantInnen vielfältiges Wissen zu den Themen Kreislaufwirtschaft, CO<sub>2</sub>-Bilanz, Schadstoffe und Bauteillogistik vermittelt. Bereits umgesetzte Wiederverwendungsprojekte werden vorgestellt und besichtigt.

### Objective

- Respekt für den Bestand, Erkennen der Identität
- Umkehrung des Entwurfsprozesses, Konstruktion mit geretteten/gefundenen Materialien
- Bauteiljägeri (Rückbauen, Bauteillogistik)
- Zirkuläres Bauen, Rückbaubarkeit, Kreislaufwirtschaft

- Berechnung der CO2-Einsparung bei Wiederverwendung
- Einblick in die wirtschaftliche Seite der Wiederverwendung

### Comment

Die Belegung unter [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch) ist erst nach der Zuteilung der Entwurfsklasse am Schluss der internen Einschreibung am D-ARCH möglich (<http://www.einschreibung.arch.ethz.ch/design.php>).

Eine Benotung des Entwurfs am Semesterende erfolgt ausschliesslich aufgrund der per Stichtag, 1.4.22, 24:00 Uhr, dokumentierten Belegungsliste. Das vorgenannte Datum ist der letzte Termin zum Löschen oder Belegen dieser Lehrveranstaltung!

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159643&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 851-0745-00L Ethics Workshop: The Impact of Digital Life on Society

**Semester:** 2022S

**Relevant SDGs:** SDG09

**ECTS:** 2

**Lecturer:** Amann, Julia Erika Josefina; Blasimme, Alessandro; Ferretti, Agata; Landers, Constantin Christian Ferdinand; Sleigh, Joanna Alina; Vayena, Eftychia

### Abstract

This workshop focuses on understanding and managing the ethical and social issues arising from the integration of new technologies in various aspects of daily life.

### Objective

Explain relevant concepts in ethics.

Evaluate the ethical dimensions of new technology uses.

Identify impacted stakeholders and who is ethically responsible.

Engage constructively in the public discourse relating to new technology impacts.

Review tools and resources currently available that facilitate resolutions and ethical practice

Work in a more ethically reflective way

### Comment

Number of participants limited to 40.

Open to all Master level / PhD students.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157861&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# Ethics Workshop: The Impact of Digital Life on Society

**Semester:** 2022W

**Relevant SDGs:** SDG09

**ECTS:**

**Lecturer:** Blasimme, Alessandro; Brall, Caroline Dorothee Viktoria; Landers, Constantin Christian Ferdinand; Sleigh, Joanna Alina; Vayena, Eftychia

**Abstract**

This workshop focuses on understanding and managing the ethical and social issues arising from the integration of new technologies in various aspects of daily life.

**Objective**

Explain relevant concepts in ethics.

Evaluate the ethical dimensions of new technology uses.

Identify impacted stakeholders and who is ethically responsible.

Engage constructively in the public discourse relating to new technology impacts.

Review tools and resources currently available that facilitate resolutions and ethical practice

Work in a more ethically reflective way

**Comment**

Number of participants limited to 40.

Open to all Master level / PhD students.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162659&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 101-0531-00L Digitalization for Circular Construction (D4C<sup>2</sup>)

**Semester:** 2022S

**Relevant SDGs:** SDG09

**ECTS:** 4

**Lecturer:** De Wolf, Catherine

## **Abstract**

Students will learn about digital innovations for circular construction (e.g. reuse of materials) through hands-on learning: they will be accompanied on demolition sites to recover and reclaim building materials, they will learn how to use computational tools to design structures with an available stock of materials, and they will use digital fabrication techniques to build a dome on campus.

## **Objective**

The project has several goals:

- Teach students about the challenges of reuse in the built environment and how to overcome them in order to transition the construction sector from a linear to a circular economy – this can only be done through the proposed industry collaboration and hands-on, on-site learning.
- Show students how to design and built from A to Z: many engineering and architecture students end up acquiring amazing design skills, but have never been on a demolition site to disassemble the structure themselves – this course will offer this experience to them.
- Demonstrate how we can bring together two worlds that are often too distinct: low-impact construction and digital innovation – this course will explore which digital tools already used in other sectors could be beneficial for reuse and low-carbon construction.

## **Comment**

All students who register go onto a waiting list and 25 of them will be selected by the lecturer

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=160598&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 151-0950-00L Sustainable Heating and Cooling Technologies

**Semester:** 2022S

**Relevant SDGs:** SDG09

**ECTS:** 4

**Lecturer:** Roskosch, Dennis

**Abstract**

This course introduces the fundamentals of sustainable heating and cooling technologies regarding thermodynamics, technology, and regulations. In addition to teaching fundamental knowledge, this course focuses on process design. In case study sessions, students solve problems related to the process design of heating and cooling technologies.

**Objective**

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

- select and use appropriate fluid property models,
- choose a proper heating and cooling technology depending on the application,
- develop mathematical models for the simulation of heat pump and cooling processes,
- design and optimize heat pump and cooling processes,
- design and select components and refrigerants,
- apply the acquired numerical methods to the process design in other fields.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159798&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 865-0066-04L ICT4D – Concepts, Strategies and Good Practices

**Semester:** 2022S

**Relevant SDGs:** SDG09, SDG10

**ECTS:** 2

**Lecturer:** Brugger, Fritz

**Abstract**

Information and communication technologies (ICTs) represent the deepest technical change experienced in international development. Digital development strategies need to be broader than ICT strategies. This course assesses the role of ICTs in development, discusses the existing evidence on the impact of ICT on development, and introduces key concepts and methods for ICT4D practice and strategy.

**Objective**

Information and communication technologies (ICTs) represent the fastest and deepest technical change experienced in international development. By now, they affect every development sector – the work of farmers and micro-entrepreneurs, healthcare workers and microfinance institutions, social mobilization and political change. Yet, the ‘digital dividends’ are unevenly distributed and questions of ‘data justice’ in development are largely unexplored. To close the gap, just greater digital adoption will

not be enough. Digital development strategies need to be broader than ICT strategies. This course helps to understand the role of ICTs in development, discusses the existing evidence on the impact of ICT on development, and introduces key concepts and methods for ICT4D practice and strategy.

### **Comment**

Only for MAS/CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation.

ETH doctoral students working on topics related to poverty reduction in low- and middle income countries may also be admitted.

ETH MA/MSc students apply with a letter of motivation to the NADEL administration office.

Registration only through the NADEL administration office.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159162&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 851-0589-00L Technology and Innovation for Development

**Semester:** 2022W

**Relevant SDGs:** SDG09, SDG17

**ECTS:** 3

**Lecturer:** Aerni, Philipp Gregory

### **Abstract**

Technology and Innovation contribute to sustainable development if institutional framework conditions create the right incentives. The course discusses the challenges associated with technological change from an interdisciplinary and practice-oriented perspective taking into account legal, economic, anthropological and development aspects.

### **Objective**

- to recognize the challenges and opportunities of technology and innovation to enable inclusive and sustainable change
- to become familiar with policy instruments designed to support innovative entrepreneurs that convert new knowledge into new products and services with positive externalities for society and the environment
- to understand the politics of regulation and its impact on technological change
- to learn how to think in terms of economic ecosystems that enable a more sustainable use of scarce resources rather than individuals that merely compete in the consumption of such resources

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163629&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

# SDG 10 – Reduced Inequalities

## 851-0648-00L Machine Learning for Global Development

**Semester:** 2022S

**Relevant SDGs:** SDG10

**ECTS:** 3

**Lecturer:** Hensgen, Leonie; Wegner, Jan Dirk

### **Abstract**

This course gives an introduction to machine learning and its application in the context of global development, with a focus on developing countries (e.g., predicting the risk of child labor or chances of a malaria outbreak). By the end of the course, students will be able to critically reflect upon linkages between technical innovations, culture and individual/societal needs.

### **Objective**

The objective of this course is to introduce students with a non-technical background to machine learning. Emphasis is on hands-on programming and implementation of basic machine learning concepts to demystify the subject, equip participants with all necessary insights and tools to develop their own solutions, and to come up with original ideas for problems related to the context of global development. Specific importance is placed upon the reconciliation of the predictions, which have been generated by automated processes, with the realities on the ground; hence the linkage between technical and social issues. This raises questions such as “In how far can we trust an algorithm?”, “Which factors are hard to measure and therefore not integrated in the algorithm but still crucial for the result, such as cultural and social influences?”. These questions will be discussed in the interdisciplinary group, equipping students with various perspectives on this crucial and very current debate.

### **Comment**

Number of participants limited to 40

Prerequisite: Students on BSc or MSc level who have already successfully participated in a data science and programming course.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159830&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# 865-0001-00L Socio-cultural Aspects of Development

**Semester:** 2022W

**Relevant SDGs:** SDG10

**ECTS:** 3

**Lecturer:** Malefakis, Medinat Adeola; Schneider, Kimon Alexis

## **Abstract**

In this course, central development issues are discussed from a historical, sociological, and anthropological perspective. Themes such as decolonization, migration, gender, racism, religion and education are used to shed light on one's own Western ideas and critically reflect on their influence on the design of interventions in development cooperation.

## **Objective**

The students will be able to

- consider which social, cultural and psychological factors influence human action, and discuss their importance for development cooperation
- explain different conceptions of development in Western and non-Western cultures and indicate possible consequences for development projects
- display basic knowledge of selected topics on social and cultural development

## **Comment**

Only for MAS in Development and Cooperation.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=165198&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 363-1129-00L Humanitarian Operations and Supply Chain Management

**Semester:** 2022S

**Relevant SDGs:** SDG10

**ECTS:** 3

**Lecturer:** Thakur-Weigold, Sarbani Bublu; Wagner, Stephan Mathias

## **Abstract**

As both manmade and natural disasters are on the increase, the humanitarian sector has been



growing accordingly. Because logistics typically comprises 70-80% of mission budgets, efficient operations and supply chain management are critical to maximizing impact. This course explores the emerging theory and best practices which address this need.

### **Objective**

Upon completion of this seminar, participants will be able to differentiate between the commercial and humanitarian operational context and recognize the distinct phases of an intervention. They will be able to assess the humanitarian program as a system with constrained resources, and analyze logistics and supply chain processes fit to purpose. The course will involve both, research and practice, to ensure a realistic and rigorous understanding of humanitarian operations and supply chain management.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157264&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 865-0007-00L History and Forms of International Development Cooperation

**Semester:** 2022W

**Relevant SDGs:** SDG10

**ECTS:** 3

**Lecturer:** Schneider, Kimon Alexis

### **Abstract**

This course presents the origins and evolution of the International Development Cooperation during the last six decades and relates the changing paradigms to their political and socio-economic contexts. It looks at the different actors with their specific roles, approaches and challenges from a Swiss as well as a global perspective.

### **Objective**

The students are able to ...

- analyse the evolution of the International Development Cooperation, selected development theories and their practical application in the historic context
- describe the Swiss landscape of actors in Development Cooperation and its integration into the international community of donors.
- assess possible implications of the Agenda 2030 for the structure and practice of the international cooperation

### **Comment**

Only for MAS in Development and Cooperation.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163793&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 151-8101-00L International Engineering: from Hubris to Hope

**Semester:** 2022W

**Relevant SDGs:** SDG10

**ECTS:** 4

**Lecturer:** Kalina, Marc Ronald; Tilley, Elizabeth Anne

**Abstract**

Since Europe surrendered their colonial assets, engineers from rich countries have returned to the African continent to address the real and perceived ills that they felt technology could solve. And yet, 70 years on, the promise of technology has largely failed to deliver widespread, substantive improvements in the quality of life. Why?

**Objective**

This course is meant for engineers who are interested in pursuing an ethical and relevant career internationally, and who are willing to examine the complex role that well-meaning foreigners have played and continue to play in the disappointing health outcomes that characterize much of the African continent.

After completing the course, participants will be able to

- critique the jargon and terms used by the international community, i.e. “development”, “aid”, “cooperation”, “assistance” “third world” “developing” “global south” “low and middle-income” and justify their own chosen terminology
- recognize the role of racism and white-supremacy in the development of the Aid industry
- understand the political, financial, and cultural reasons why technology and infrastructure have historically failed
- Debate the merits of international engineering in popular culture and media
- Propose improved SDG indicators that address current shortcomings
- Compare the engineering curricula of different countries to identify relative strengths and shortcomings
- Explain the inherent biases of academic publishing and its impact on engineering failure

- Analyse linkages between the rise of philanthropy and strategic priority areas
- Recommend equitable, just funding models to achieve more sustainable outcomes
- Formulate a vision for the international engineer of the future

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163656&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 865-0037-00L M4P - Making Markets Work for the Poor

**Semester:** 2022S

**Relevant SDGs:** SDG10, SDG08

**ECTS:** 2

**Lecturer:** Harttgen, Kenneth

**Abstract**

The course conveys basic knowledge about the M4P-project approach in development cooperation (Making Markets Work for the Poor). Important elements are: strategic framework of the M4P-concept; understanding systems and system change; sustainability and facilitation of system change; measurement and management of private sector promotion in development assistance.

**Objective**

The course conveys basic knowledge about the M4P-project approach in development cooperation (Making Markets Work for the Poor). Important elements are: strategic framework of the M4P-concept; understanding systems and system change; sustainability and facilitation of system change; measurement and management of private sector promotion in development assistance.

**Comment**

Only for MAS/CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation.

ETH doctoral students working on topics related to poverty reduction in low- and middle income countries may also be admitted.

Registration only through the NADEL administration office.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158219&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 851-0649-00L International Development Engineering

**Semester:** 2022S

**Relevant SDGs:** SDG10, SDG09

**ECTS:** 1

**Lecturer:** Günther, Isabel; Shea, Kristina Ann; Tilley, Elizabeth Anne

## **Abstract**

In this seminar, students will learn from researchers around the globe about technological interventions designed to improve human and economic development within complex, low-resource setting. Students will also get familiar with frameworks from social sciences and engineering, helping them to understand, and evaluate the discussed technologies and to put them into a broader context.

## **Objective**

- Students will get familiar with frameworks from social sciences and engineering needed for innovation in a complex, low-resource setting.
- Students will learn about concrete examples of technological interventions designed to improve sustainable development and critically reflect on them.
- Students get a broad understanding of some of the most important issues and discussions related to global sustainable development.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159779&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# SDG 11 – Sustainable Cities & Communities

## 052-1118-22L Entwurf V-IX: Hohe Häuser - Mehr mit Weniger II (Guyer)

**Semester:** 2022S

**Relevant SDGs:** SDG11

**ECTS:** 14

**Lecturer:** Guyer, Michael Adam

### **Abstract**

Wir fokussieren uns zusammen mit der Block Research Group auf die Tragstruktur, die rund 75% der grauen Energie eines Hochhauses ausmacht. Anhand eines Katalogs von Baustrukturen in verschiedenen Materialien suchen wir nach effizienten, leichten Konstruktionen, um die graue Energie und den CO<sub>2</sub>-Fussabdruck markant zu reduzieren.

### **Objective**

Befähigung, einen Entwurf von einer Idee, einem Konzept bis zu einem ausgereiften Projekt zu entwickeln, Zwischenstufen immer wieder selbstkritisch zu hinterfragen und dabei zu einer individuellen Entwurfsmethodik und -haltung zu finden.

### **Comment**

Die Belegung unter [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch) ist erst nach der Zuteilung der Entwurfsklasse am Schluss der internen Einschreibung am D-ARCH möglich (<http://www.einschreibung.arch.ethz.ch/design.php>).

Eine Benotung des Entwurfs am Semesterende erfolgt ausschliesslich aufgrund der per Stichtag, 1.4.22, 24:00 Uhr, dokumentierten Belegungsliste. Das vorgenannte Datum ist der letzte Termin zum Löschen oder Belegen dieser Lehrveranstaltung!

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159610&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# 052-1127-22L Architectural Design V-IX: Designing Flood Relief Landscapes in Antananarivo (Giro)

**Semester:** 2022W

**Relevant SDGs:** SDG11

**ECTS:** 14

**Lecturer:** Giro, Frédéric Christophe

## **Abstract**

The Landscape Architecture Studio in the Fall 2022 will investigate the innovative designs for flood relief in Antananarivo. It will address the peri-urban context of the city that is subject to severe seasonal flooding. The site-specific approach includes modeling of resilient landscape infrastructures to enhance the safety of neighborhoods located on the banks of the Ikopa and Sisaony rivers.

## **Objective**

The goal of this Design Research Studio is to develop design solutions for the flood prone areas of Greater Antananarivo, Madagascar, implementing a resilient landscape infrastructure. Students will learn digital modelling techniques through topological analysis and design. This will enable them to imagine and design precise flood- and food-resilient landscape systems in the urban-agricultural context of Antananarivo. The digital models will be assessed for their performance and feasibility through pluvial simulation models and ecosystem services assessment. Through the use of precise modeling techniques based on laser-scanned data, students will learn to move iteratively towards a final landscape design proposal that will compound topography, infrastructure and vegetation. The studio is part of an ETH Future Cities Laboratory collaboration with researchers and designers from local universities, that will strengthen our knowledge about the broader socio-ecological context of Madagascar. The studio includes a compulsory site visit to Antananarivo for ETH students in the Autumn of 2022.

## **Comment**

Please register ([www.mystudies.ethz.ch](http://www.mystudies.ethz.ch)) only after the internal enrolment for the design classes (see <http://www.einschreibung.arch.ethz.ch/design.php>).

Project grading at semester end is based on the list of enrolments on 1.11.22, 24:00 h (valuation date) only. This is the ultimate deadline to unsubscribe or enroll for the studio.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164502&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 103-0570-00L Urban Planning and Urban Policy

**Semester:** 2022S

**Relevant SDGs:** SDG11

**ECTS:** 4

**Lecturer:** Kaufmann, David

**Abstract**

We live in an urban and urbanizing society. Cities and dense regions are places where transformations such as climate change, economic globalization, settlement expansions, migration, or digitization manifest themselves first and most clearly. In this lecture, we study how cities plan for and react to these global transformations.

**Objective**

Overall learning goal: Students can describe and explain the problems that arise in dense urban settings and they can analyze and compare how cities plan for and react to these urban problems through planning and policy-making

Learning objective 1: Students can explain and infer what kind of problems emerges in cities

Learning objective 2: Students discover and analyze different urban policy sectors

Learning objective 3: Students can compare and evaluate different types of urban planning and policy-making approaches

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159435&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 052-1139-22L Architectural Design V-IX: Circular City (H. Klumpner)

**Semester:** 2022W

**Relevant SDGs:** SDG11

**ECTS:** 14

**Lecturer:** Klumpner, Hubert

**Abstract**

Let's build a circular city, transiting towards a zero-waste community.

The promise of unlimited growth perpetuates our culture of unsustainable material flows and the production of junk products. Could we value resources, act socio-ecological responsive, and design a Circuit-Workshop prototype into a system of productive public spaces, as commons for work and community?

**Objective**

Students immersed in our "method-design", will develop a system of individual prototypical design projects. We moderate and guide a trans-scalar understanding of architecture, urban design, and planning, developing collaboratively a baseline scenario. Research by mapping, identifying, reading

context, existing and future challenges and opportunities, assist students taking on roles of decision-making stakeholders, to Co-creative translate their findings and resources into different scenarios. We synthesize the scenarios in design strategies and urbanistic concepts, translating them into an evidence-based, prototypical architectural project intervention. This prototype responds to dynamic real-world processes, over time and space. We frame urban design projects as a narrative, that is consequently visualized and communicated in analog and digital graphic and model representations. The concept project will be tested and upscaled through urbanistic design-policy recommendations within overlapping spatial and programmatic systems and material propositions into an architectural relevant pilot project.

Based on our Chair's "Urban Stories" lecture series, students will use the reference framework of the urban toolbox and our catalog of evidence-based design examples of what works and what are the trade-offs in the complexities of a specific environment. Design solutions are responding to the site's environmental, social, and governance challenges and context. At the intersection of urban -and landscape design, and public arts, we envision trans-scalar dynamic developments and radical urban imaginaries for societal transformation.

"(...) we believe that we have enough buildings, enough construction, enough infrastructure. And it is now time to consolidate it and find the qualities within the built. This is not against future production, it is more about a consideration of what we really want in cities."

(AD Interviews: Hubert Klumpner / 2015 Bi-City Biennale of Urbanism\Architecture)

We will discuss spatial processes following our practical, real-life experiences, consolidating along a sequence of transformative steps of short-term tactics for long-term strategies and value production. We will scrutinize the need to re-evaluate neighborhoods' transformations initiated by art, popular culture, local participation, densifying social interaction, and place-making with our concern to avoid displacing existing populations.

Urban- and Landscape Design can create a measurable positive impact in cities by caring for social justice, health, and wellbeing in times of climate change. The development of a robust framework enables regeneration processes with long-term operational, environmental and social benefits in response to global, local, and site-specific challenges. The role of architects is to imagine and model sustainable urban scenarios recognizing urban corridors as new possibilities and lifelines to impact meaningful and multidimensional transformative design strategies.

For every city, design is about different things; what remains are the values, choices, opportunities, and engaged societies and how we realize and implement a concrete project in a city neighborhood relevant to our care for earth.

### **Comment**

Please register ([www.mystudies.ethz.ch](http://www.mystudies.ethz.ch)) only after the internal enrolment for the design classes (see <http://www.einschreibung.arch.ethz.ch/design.php>).

Teaching Languages: English and German

Project grading at semester end is based on the list of enrolments on 1.11.22, 24:00 h (valuation date) only. This is the ultimate deadline to unsubscribe or enroll for the studio.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164508&semkez=2022W&ansicht=KATALOGDATEN&lang=de>



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# 052-1148-22L Architectural Design V-IX: Village Life - Beyond the Urban-Rural Divide (Topalovic)

**Semester:** 2022S

**Relevant SDGs:** SDG11

**ECTS:** 14

**Lecturer:** Topalovic, Milica

## **Abstract**

Villages have lost most of their historic features. Peasant populations and traditional farming no longer exist. Yet village life continues to provoke imagination, and to promise an alternative path, an antidote to life in cities. During the semester you will write your own project brief and develop a research and a design project for a specific village in the Canton of Zurich.

## **Objective**

During the semester you will write your own project brief and develop a research and a design project for a specific village in the Canton of Zurich. The work takes form of a web-based investigative reportage. In the villages you will work through interviews, sketches, video and fieldnotes. Back in the studio you will work with the help of experts in GIS, web design, architectural writing and videography. Your reportages and visions will be presented online and in the public forum meant to inform design practises and public discourse.

## **NEW ECOLOGIES**

New Ecologies is a studio series at the Architecture of Territory dedicated to ecologising architecture. Ecological thinking (which foregrounds the interactions between organisms and by extension between objects or social-technical systems and their environments) is applied in relation to design practises and their social and environmental effects. The studio series is affiliated with the Future Cities Laboratory (FCL) and the new Master of Advanced Studies in Urban and Territorial Design (MAS UTD).

## **PROCESS AND RESULTS**

The semester consists of investigative journeys and studio sessions. Architecture of Territory values intellectual curiosity, commitment, and team spirit. We are looking for eager explorers and team workers, motivated to make strong and independent contributions. Our approach enables you to work with a range of methods and sources pertaining to territory, including ethnographic fieldwork, interviews, literature research and writing, large-scale drawing techniques, videography, and online publishing. Experts and guests will help you sharpen your skills and craft common agendas through debates. You will work in groups of two or three. **FIELD WORK** Investigative journeys constitute the core of the research and design project. We will spend several days out in the field, starting already on the first day of the studio. Throughout the semester, common expeditions and individual fieldwork investigations form an essential component of your work.

## **LECTURE SERIES**

The lecture series SESSIONS ON TERRITORY: Urbanism and the Countryside, is highly recommended as an addition to the studio. Focusing on agriculture, the series will draw upon relationships of care and reciprocity with soil and biodiversity from the past and present, to help move beyond consumerist techno-fixes, and toward more self-sufficient and ecological land practices.

#### **Comment**

Please register ([www.mystudies.ethz.ch](http://www.mystudies.ethz.ch)) only after the internal enrolment for the design classes (see <http://www.einschreibung.arch.ethz.ch/design.php>).

Project grading at semester end is based on the list of enrolments on 1.4.22, 24:00 h. This is the ultimate deadline to unsubscribe or enroll for the studio!

#### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159645&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 052-0815-22L Seminar Architekturkritik: Ökokritik – oder der neue Blick auf Beton-Architektur

**Semester:** 2022W

**Relevant SDGs:** SDG11

**ECTS:** 2

**Lecturer:** Stahl, Antje; Stalder, Laurent Jean

#### **Abstract**

Die Architekturkritik muss sich neue Kriterien erarbeiten, um Bauten ins rechte Verhältnis zur Umwelt zu setzen. Der ökologische Blick richtet sich in diesem Seminar ganz besonders auf den Baustoff Beton, um über seine kriminelle Ökonomie sowie ästhetische Überhöhung aufzuklären.

#### **Objective**

In diesem Seminar werden investigative Recherche, Schreiben als Handwerk sowie publizistische Strategien erprobt und vermittelt. Anhand von ausgewählten Medien werden mögliche Formate studiert und in Einzel- aber auch kollektiver Arbeit umgesetzt.

#### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164462&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

# 052-0858-22L Geschichten und Theorien der Architektur und deren aktuelle Bedeutung

**Semester:** 2022S

**Relevant SDGs:** SDG11

**ECTS:** 1

**Lecturer:** Wegerhoff, Erik

## **Abstract**

Dieser Kurs diskutiert Aspekte der Geschichte und Theorie der Architektur mit spezifischem Interesse für deren aktuelle Relevanz und heutige Interpretation.

## **Objective**

Das Bewusstsein für die aktuelle Bedeutung und zeitgenössische Auffassungen von Geschichte und Theorie der Architektur wird ausgebildet und gefördert.

## **Comment**

Diese Lehrveranstaltung wird bis FS24 angeboten.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=161201&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 064-0020-22L Understanding the Future City

**Semester:** 2022S

**Relevant SDGs:** SDG11

**ECTS:** 1

**Lecturer:** Cairns, Stephen Russell

## **Abstract**

This course is an introductory course designed for researchers, PhD students from diverse disciplinary backgrounds. It is intended to give an overview of common concepts and research vocabularies relevant to all work conducted in the Future Cities Lab Global, and to be an opportunity for researchers and PhD students to work together across disciplinary lines and project groups.

## **Objective**

The objective of the course are two folds:

- Via introducing research conducted in the Future Cities Lab Global from various disciplines, the course enables researchers and PhD students to establish a systemic and comprehensive understanding of urbanisation with a global perspective.

• Based on the conveyed knowledge, researchers and PhD students are able to think, communicate and work together across disciplinary lines; and ultimately initiate creative and sound ideas and frameworks for their own research.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159599&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 052-0717-22L Territorium der Stadt: Turin

**Semester:** 2022W

**Relevant SDGs:** SDG11

**ECTS:** 2

**Lecturer:** Vogt, Günther

**Abstract**

Das Wahlfach befasst sich mit aktuellen Transformationsprozessen metropolitaner Landschaften in Europa und führt in das landschaftsarchitektonische Entwerfen im territorialen Massstab ein. Auf Basis eines Fieldtrips und kartografischer Analysen mittels GIS entwickeln die Studierenden konkrete Strategien für die urbane Landschaft der Città Metropolitana di Torino.

**Objective**

Das Wahlfach führt in die Thematik der urbanisierten Landschaft und deren Vielschichtigkeit und Komplexität ein und vermittelt den kritischen Umgang mit den Herausforderungen und Potentialen aktueller landschaftlichen Entwicklungstendenzen. Anhand eines konkreten Bearbeitungsgebiets untersuchen die Architekturstudierenden die grossräumlichen Umnutzungs-, Umformungs- und Umdeutungsprozesse metropolitaner Landschaften in Europa und entwickeln neue Ansätze und Strategien auf unterschiedlichen Massstabebenen. Sie machen sich mit GIS als Analysetool, Modellbau als Entwurfsmethode und landschaftsarchitektonischer Plandarstellung vertraut. Die Basis für die Projekte bilden individuelle Erfahrungen und Wahrnehmungen des Orts, Kenntnisse der landschaftsarchitektonischen Typologie und Vorstellungen zum öffentlichen Raum. Der Entwurfsprozess wird von Workshops, Vorlesungen, Exkursionen, Kritiken sowie einem Workbook begleitet.

**Comment**

Maximale Teilnehmerzahl: 12

Die Belegung ist nur nach gegenseitiger Vereinbarung mit dem Dozent möglich.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164457&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 052-0718-22L Territorium der Stadt: Zürich

**Semester:** 2022S

**Relevant SDGs:** SDG11

**ECTS:** 2

**Lecturer:** Vogt, Günther

### **Abstract**

Das Wahlfach befasst sich mit aktuellen Transformationsprozessen metropolitaner Landschaften in Europa und führt in das landschaftsarchitektonische Entwerfen im territorialen Massstab ein.

Auf Basis eines Fieldtrips und kartografischer Analysen mittels GIS entwickeln die Studierenden konkrete Strategien für den Metropolitanraum Zürich bis zu den Agglomerationen von Winterthur, Baden und Zug.

### **Objective**

Das Wahlfach führt in die Thematik der urbanisierten Landschaft und deren Vielschichtigkeit und Komplexität ein und vermittelt den kritischen Umgang mit den Herausforderungen und Potentialen aktueller landschaftlichen Entwicklungstendenzen. Anhand eines konkreten Bearbeitungsgebiets untersuchen die Architekturstudierenden die grossräumlichen Umnutzungs-, Umformungs- und Umdeutungsprozesse metropolitaner Landschaften in Europa und entwickeln neue Ansätze und Strategien auf unterschiedlichen Massstabsebenen. Sie machen sich mit GIS als Analysetool, Modellbau als Entwurfsmethode und landschaftsarchitektonischer Plandarstellung vertraut. Die Basis für die Projekte bilden individuelle Erfahrungen und Wahrnehmungen des Orts, Kenntnisse der landschaftsarchitektonischen Typologie und Vorstellungen zum öffentlichen Raum. Der Entwurfsprozess wird von Workshops, Vorlesungen, Exkursionen, Kritiken sowie einem Workbook begleitet.

### **Comment**

Maximale Teilnehmerzahl: 12

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159563&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 063-0805-22L History and Theory in Architecture IX

**Semester:** 2022W

**Relevant SDGs:** SDG11

**ECTS:** 1

**Lecturer:** Avermaete, Tom; Teerds, Pieter Johannes

**Abstract**

This course offers a brief introduction to contemporary urban problems and challenges. Based on a thematic approach, the course explores how these issues pose a challenge to the fields of architecture, urban design and planning.

**Objective**

This course aims to offer a survey of the history and current state of urban theory for students of urban design and architecture.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164572&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 101-0588-01L Re-/Source the Built Environment

**Semester:** 2022S

**Relevant SDGs:** SDG11

**ECTS:** 3

**Lecturer:** Habert, Guillaume

**Abstract**

The course focuses on material choice and energy strategies to limit the environmental impact of construction sector. During the course, specific topics will be presented (construction technologies, environmental policies, social consequences of material use, etc.). The course aims to present sustainable options to tackle the global challenge we are facing and show that "it is not too late".

**Objective**

After the lecture series, the students are aware of the main challenges for the production and use of building materials.

They know the different technologies/propositions available, and environmental consequence of a choice.

They understand in which conditions/context one resource/technology will be more appropriate than another

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158435&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# 052-1124-22L Entwurf V-IX: Europark Antwerpens Linkeroever nachhaltig verdichten (GD Boltshauser)

**Semester:** 2022S

**Relevant SDGs:** SDG11

**ECTS:** 14

**Lecturer:** Boltshauser, Roger

## **Abstract**

Die Stadt Antwerpen entwickelt zurzeit den Masterplan für das linke Ufer der Schelde. Wir nehmen dies zum Anlass, uns mit dem Ort im Diskurs mit der Stadtverwaltung und SpezialistInnen zu beschäftigen. Wir wollen in einem analytischen, entwerferischen Prozess einen Beitrag zur Entwicklung des Masterplans leisten.

## **Objective**

- Auseinandersetzung mit dem verdichteten, nachhaltigen, einfachen Bauen vom Masterplan zum einzelnen Gebäude
- Erarbeitung eines breiten theoretischen Wissens über ein Thema, um die daraus resultierenden Erkenntnisse in ein Projekt zu integrieren
- Ganzheitliche Gestaltung von Raumatmosphären im Zusammenspiel von Kontext, Konstruktion, Klima, Nachhaltigkeit und Materialität
- Praktische Arbeit am Modell und im Visualisierungsprogramm als Teil des Entwurfsprozesses

## **Comment**

Die Belegung unter [www.mystudies.ethz.ch](http://www.mystudies.ethz.ch) ist erst nach der Zuteilung der Entwurfsklasse am Schluss der internen Einschreibung am D-ARCH möglich (<http://www.einschreibung.arch.ethz.ch/design.php>).

Eine Benotung des Entwurfs am Semesterende erfolgt ausschliesslich aufgrund der per Stichtag, 1.4.22, 24:00 Uhr, dokumentierten Belegungsliste. Das vorgenannte Datum ist der letzte Termin zum Löschen oder Belegen dieser Lehrveranstaltung!

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159624&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 078-0203-00L Urban Ecology

**Semester:** 2022S

**Relevant SDGs:** SDG11

**ECTS:** 3

**Lecturer:** Küffer Schumacher, Christoph

**Abstract**

Green cities and nature-based solutions have become central themes of architecture and territorial planning. The course enables students to apply ecological thinking to urban design.

**Objective**

- Students get introduced to the thinking of ecologists and the basic concepts of ecology and evolution to be able to approach design and planning questions from an ecological perspective and to interact with ecologists.
- The city is introduced as an ecological system and the key elements of urban ecology are discussed.
- The relevance of ecological and evolutionary processes and patterns for urban design and planning are discussed based on contemporary real-world examples.
- The intersections between ecological science and new philosophical concepts of relevance to urban design are explored, e.g. Anthropocene, biophilic design, species coexistence, or animal-aided design.

**Comment**

Only for MAS in Urban and Territorial Design

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159474&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 860-0044-00L Urban Planning and Urban Policy - Research Paper

**Semester:** 2022S

**Relevant SDGs:** SDG11

**ECTS:** 3

**Lecturer:** Kaufmann, David

**Abstract**

We live in an urban and urbanizing society. Cities and dense regions are places where transformations such as climate change, economic globalization, settlement expansions, migration, or digitization manifest themselves first and most clearly. In this lecture, we study how cities plan for and react to these global transformations.



### Objective

The research paper gives student an opportunity to conduct an in-depth (comparative) case study of interesting urban policies in cities worldwide. The research paper is a case-based analysis of a urban policy issue that students can choose based on the course content and their interest. The length of the research paper should be around 4000 words, excluding references.

### Comment

Permit by the lecturer is required. Students must be enrolled in the lecture 103-0570-00 G, Urban Planning and Urban Policy.

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=161005&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 052-0727-22L 4D-Geodesigning Urban Transformation - Summer School

**Semester:** 2022W

**Relevant SDGs:** SDG11

**ECTS:** 3

**Lecturer:** Klumpner, Hubert; Wälty, Sibylle

### Abstract

The project addresses critical issues of urban planning by using cutting-edge technology for analysis and communication. Students actively engage with building and zoning regulations ((i) reconstruct, (ii) reformulare and (iii) simulate/virtualise in web-based 4D urban models) as well as maintain an ongoing exchange through (peer) review activities in class.

### Objective

- Capture and analyse the past and present; design, present and discuss future living spaces in 4D.
- Read, understand, deconstruct and formulate new zoning and building rules (BNO)s.
- Set up an ArcGIS Urban model and integrate current and new urban rules and visualize/simulate development scenarios/variations of urban designs.
- Learn from students from different disciplines through teamwork and by peer-reviewing each other's work.
- System thinking through causal loops.

### Comment

Is offered until end of FS23.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=165929&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 052-0911-22L Reparatur: Thema

**Semester:** 2022W

**Relevant SDGs:** SDG11

**ECTS:** 2

**Lecturer:** Langenberg, Silke

**Abstract**

Komplexe Konstruktionen, schwierige Materialien und industrielle Herstellungsprozesse haben dazu geführt, dass nicht nur im Produktdesign, sondern auch in der Architektur, die Lebensdauer von Objekten nimmt. Der Reparaturfähigkeit wird ein immer geringerer Stellenwert beigemessen.

**Objective**

Klassische Themen der Denkmalpflege werden mit neueren Ansätzen der Repair- und FAB-Bewegung verknüpft, um für ein nachhaltiges Denken und Handeln zu sensibilisieren. Erlern werden sowohl traditionelle als auch digitale Techniken sowie die grundsätzlichen konstruktiven und materiellen Voraussetzungen für eine Reparatur. Ziel ist neben der praktischen Instandsetzung eines Objektes vor allem der theoretische Transfer in die Architektur.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164483&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 101-0587-00L Workshop on Sustainable Building Certification

**Semester:** 2022W

**Relevant SDGs:** SDG11, SDG07

**ECTS:** 3

**Lecturer:** Kellenberger, Daniel

**Abstract**

Building labels are used to certify buildings and neighbourhoods in term of sustainability. Many different labels have been developed and can be used in Switzerland (LEED, DGNB, SNBS, Minergie,

2000-Watt-Sites). In this course the differences between the certification labels and its application on 3 emblematic case study buildings will be discussed.

### **Objective**

After this course, the students are able to understand and use the different certification labels.

They have a clear view of what the labels take into consideration and what they don't.

### **Comment**

Maximale Teilnehmerzahl: 25

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162315&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 101-0427-01L Public Transport Design and Operations

**Semester:** 2022W

**Relevant SDGs:** SDG11, SDG09

**ECTS:** 6

**Lecturer:** Corman, Francesco; Yan, Tzu-Hao

### **Abstract**

This course aims at analyzing, designing, improving public transport systems, as part of the overall transport system.

### **Objective**

Public transport is a key driver for making our cities more livable, clean and accessible, providing safe, and sustainable travel options for millions of people around the globe. Proper planning of public transport system also ensures that the system is competitive in terms of speed and cost. Public transport is a crucial asset, whose social, economic and environmental benefits extend beyond those who use it regularly; it reduces the amount of cars and road infrastructure in cities; reduces injuries and fatalities associated to car accidents, and gives transport accessibility to very large demographic groups.

Goal of the class is to understand the main characteristics and differences of public transport networks.

Their various performance criteria based on various perspective and stakeholders.

The most relevant decision making problems in a planning tactical and operational point of view

At the end of this course, students can critically analyze existing networks of public transport, their design and use; consider and substantiate possible improvements to existing networks of public transport and the management of those networks; optimize the use of resources in public transport.

General structure: general introduction of transport, modes, technologies, system design and line planning for different situations, mathematical models for design and line planning, timetabling and tactical planning, and related mathematical approaches, operations, and quantitative support to operational problems, evaluation of public transport systems.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162618&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 363-1150-00L Managing the Transition to Sustainable Mobility

**Semester:** 2022S

**Relevant SDGs:** SDG11, SDG09

**ECTS:** 3

**Lecturer:** Hoppmann, Jörn Hendrik

**Abstract**

Addressing current societal and ecological challenges, such as climate change, requires a major transformation of the mobility sector. Drawing on case studies and insights from the academic literature, the course provides an overview of the required changes and discusses the measures that allow individuals, organizations, societies, and policy makers to successfully manage this transition.

**Objective**

After taking this course, students will be able to:

- Know important trends and challenges in the mobility sector with regard to sustainability
- Understand the changes required at the individual, societal, organisational, political, and system level to address sustainability challenges
- Critically analyze interactions between the levels
- Apply frameworks and concepts from the academic literature that help understand and structure potential solutions to the challenges
- Derive and critically assess potential solutions and measures that help manage the transition to sustainable mobility at the different levels

**Comment**

Number of participants: Max. 20 persons, selected based on waiting list.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159344&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# 101-0577-00L An Introduction to Sustainable Development in the Built Environment

**Semester:** 2022W

**Relevant SDGs:** SDG11, SDG10

**ECTS:** 3

**Lecturer:** Habert, Guillaume; Kaushal, Deepshi

## **Abstract**

In 2015, the UN Conference in Paris shaped future world objectives to tackle climate change.

in 2016, other political bodies made these changes more difficult to predict.

What does it mean for the built environment?

This course provides an introduction to the notion of sustainable development when applied to our built environment

## **Objective**

At the end of the semester, the students have an understanding of the term of sustainable development, its history, the current political and scientific discourses and its relevance for our built environment.

In order to address current challenges of climate change mitigation and resource depletion, students will learn a holistic approach of sustainable development. Ecological, economical and social constraints will be presented and students will learn about methods for argumentation and tools for assessment (i.e. life cycle assessment).

For this purpose an overview of sustainable development is presented with an introduction to the history of sustainability and its today definition as well as the role of cities, urbanisation and material resources (i.e. energy, construction material) in social economic and environmental aspects.

The course aims to promote an integral view and understanding of sustainability and describing different spheres (social/cultural, ecological, economical, and institutional) that influence our built environment.

Students will acquire critical knowledge and understand the role of involved stakeholders, their motivations and constraints, learn how to evaluate challenges, identify deficits and define strategies to promote a more sustainable construction.

After the course students should be able to define the relevance of specific local, regional or territorial aspects to achieve coherent and applicable solutions toward sustainable development.

The course offers an environmental, socio-economic and socio-technical perspective focussing on buildings, cities and their transition to resilience with sustainable development. Students will learn on theory and application of current scientific pathways towards sustainable development.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162314&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 052-1120-22L Architectural Design V-IX: "Im Bestand" (THF) (Brandlhuber)

**Semester:** 2022S

**Relevant SDGs:** SDG11, SDG10

**ECTS:** 14

**Lecturer:** Brandlhuber, Arno Hans

**Abstract**

"Both and" vs "either or":

The slogan put forward by the initiate: "Either a field for all or for a privileged few" was populist precisely in what was excluded from the discussion: A dialogical understanding of interests. Instead of creating the dichotomy of "either – or" we suggest using "both – and" asking: who builds where for whom?

**Objective**

Prefigurative Architecting:

The ability to think in different scales and systems, in order to determine issues and themes by observing the changing conditions of our environment. The aim is to develop an architectural position in relation to these observations and to translate it into a viable and sustainable proposal for the future of our coexistence.

Storytelling and narrative-design:

The ability to translate factual knowledge about architecture and architectural systems into a story. These narratives function in parallel and offer other ways and speeds of communicating the design arguments besides the factual approach. In addition to time-based media such as film and episodic video formats which we call television, we will be developing additional formats with the students.

**Comment**

Please register ([www.mystudies.ethz.ch](http://www.mystudies.ethz.ch)) only after the internal enrolment for the design classes (see <http://www.einschreibung.arch.ethz.ch/design.php>).

Project grading at semester end is based on the list of enrolments on 1.4.22, 24:00 h. This is the ultimate deadline to unsubscribe or enroll for the studio!

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159611&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 052-0724-22L Sociology: Agrarian Questions Under Extended Urbanisation

**Semester:** 2022S

**Relevant SDGs:** SDG11, SDG2

**ECTS:** 2

**Lecturer:** Bathla, Nitin; Schmid, Christian

### **Abstract**

As the prospect of complete urbanisation increasingly becomes a concrete rather than abstract reality, architecture and urban studies is consistently confronted with the agrarian question. This research seminar introduces some of the key concepts and ideas around the agrarian question and extended urbanisation in agrarian territories.

### **Objective**

Through this course, the seminar participants are expected to develop a critical understanding of the agrarian question, its political economy, and urbanisation in the agrarian territories. The participants are thus expected to actively engage in presenting, discussing, and debating the recommended literature for the seminar. Furthermore, the participants are encouraged to identify alternatives and imagine the possibilities for architectural and urban practice in the agrarian territories.

In summary, the seminar aims to accomplish the following:

- Allow the seminar participants to gain a critical understanding of the concepts, ideas, and debates around the agrarian question, agrarian ecology, and extended urbanisation.
- Strengthen the ability of the seminar participants to read, present, and debate academic texts.
- Develop ideas for architectural and urban practice in agrarian territories.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159565&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 078-0303-00L Urban Theory Seminar: Agrarian Questions Under Extended Urbanisation

**Semester:** 2022S

**Relevant SDGs:** SDG11, SDG2

**ECTS:** 2

**Lecturer:** Bathla, Nitin; Schmid, Christian

**Abstract**

As the prospect of complete urbanisation increasingly becomes a concrete rather than abstract reality, architecture and urban studies is consistently confronted with the agrarian question. This research seminar introduces some of the key concepts and ideas around the agrarian question and extended urbanisation in agrarian territories.

**Objective**

Through this course, the seminar participants are expected to develop a critical understanding of the agrarian question, its political economy, and urbanisation in the agrarian territories. The participants are thus expected to actively engage in presenting, discussing, and debating the recommended literature for the seminar. Furthermore, the participants are encouraged to identify alternatives and imagine the possibilities for architectural and urban practice in the agrarian territories.

In summary, the seminar aims to accomplish the following:

- Allow the seminar participants to gain a critical understanding of the concepts, ideas, and debates around the agrarian question, agrarian ecology, and extended urbanisation.
- Strengthen the ability of the seminar participants to read, present, and debate academic texts.
- Develop ideas for architectural and urban practice in agrarian territories.

**Comment**

Only for MAS in Urban and Territorial Design

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159477&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# SDG 12 – Responsible Production & Consumption

## 078-0201-00L Building Design in the Circular Economy (EPFL)

**Semester:** 2022W

**Relevant SDGs:** SDG12

**ECTS:** 3

**Lecturer:** external organisers

### **Abstract**

Lecturer: C. Fivet. The circular economy consists in maintaining the value of products as long as possible by extending or renewing their service life while minimizing resource depletion, waste and greenhouse gas emissions. The integration of these principles in the construction industry has many facets that often contradict each other.

### **Objective**

While introducing students to the concept of the circular economy and its applications to building design, the class provides ready-to-use techniques and aims at developing a critical mindset towards their use. Following a 'flipped classroom' methodology, the class devles into recent literature and practice by means of adversarial open debates. Examination consists in the writing of a short personal essay on a chosen topic and its oral defence.

### **Comment**

Only for MAS in Urban and Territorial Design

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163740&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 860-0015-00L Supply and Responsible Use of Mineral Resources I

**Semester:** 2022S

**Relevant SDGs:** SDG12

**ECTS:** 3

**Lecturer:** Brugger, Fritz; Dolejs Schlöglova, Katerina; Hellweg, Stefanie; Karydas, Christos; Wehrli, Bernhard

## **Abstract**

Students critically assess the economic, social, political, and environmental implications of extracting and using energy resources, metals, and bulk materials along the mineral resource cycle for society. They explore various decision-making tools that support policies and guidelines pertaining to mineral resources, and gain insight into different perspectives from government, industry, and NGOs.

## **Objective**

Students will be able to:

- Explain basic concepts applied in resource economics, economic geology, extraction, processing and recycling technologies, environmental and health impact assessments, resource governance, and secondary materials.
- Evaluate the policies and guidelines pertaining to mineral resource extraction.
- Examine decision-making tools for mineral resource related projects.
- Engage constructively with key actors from governmental organizations, mining and trading companies, and NGOs, dealing with issues along the mineral resource cycle.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158394&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 363-0387-00L Corporate Sustainability

**Semester:** 2022W

**Relevant SDGs:** SDG12, SDG08

**ECTS:** 3

**Lecturer:** Hoffmann, Volker; Meuer, Johannes

## **Abstract**

The lecture explores current challenges of corporate sustainability and prepares students to become champions for sustainable business practices. In the beginning, traditional lectures are complemented by e-modules that allow students to train critical thinking skills. In the 2nd half of the semester, students work in teams on sustainability challenges related to water, energy, mobility, and food.

## Objective

Students

- assess the limits and the potential of corporate sustainability for sustainable development
- develop critical thinking skills (argumentation, communication, evaluative judgment) that are useful in the context of corporate sustainability using an innovative writing and peer review method.
- recognize and realize opportunities through team work for corporate sustainability in a business environment
- present strategic recommendations in teams with different output formats (tv-style debate, consultancy pitch, technology model walk-through, campaign video)

## VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162133&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 363-1060-00L Strategies for Sustainable Business

**Semester:** 2022S

**Relevant SDGs:** SDG12, SDG08

**ECTS:** 2

**Lecturer:** Meuer, Johannes

## Abstract

In this course, students will learn to critically analyze strategies for sustainable business through exploring case studies on three main questions:

1. What is sustainability in business?
2. How do I design a sustainability strategy?
3. How do I implement a sustainability strategy?

## Objective

After the course, you should be able to:

1. Understand and explain sustainability challenges companies are facing;
2. Critique sustainability and related strategies;
3. Evaluate decisions taken by managers;
4. Suggest alternative approaches;
5. Develop action plans;
6. Reflect on strategies for sustainability in their own organizations.

You will also learn to apply a range of strategy concepts to sustainability challenges, including leadership, stakeholder management, diversification, and organizational change.

## Comment

Limited number of participants.

Registration will only be effective once confirmed by email from the organizers.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158921&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 364-1154-00L Technological Innovations and Sustainability Transitions

**Semester:** 2022S

**Relevant SDGs:** SDG12, SDG09

**ECTS:** 3

**Lecturer:** Markard, Joachim Oskar Horst

**Abstract**

This course introduces sustainability transitions: fundamental socio-technical changes in sectors such as energy or transport with the intention to arrive at more sustainable modes of production and consumption. It includes contemporary and historical examples of transitions and key concepts & frameworks for studying transitions. We discuss challenges for research, management and policy making.

**Objective**

The course provides a better understanding of innovation, transition and sustainability challenges. After completing this course, students will

- understand the particularities and complexities of selected empirical examples of sustainability transitions,
- be familiar with key concepts and frameworks of research in sustainability transitions and innovation studies,
- know the relevant literature on transition studies and adjacent fields (corporate sustainability, policy analysis) and
- be able to apply the new knowledge, e.g. to design a research project in the field.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158367&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 327-2127-00L Sustainable Materials Management: Concepts, Methods and Principles

**Semester:** 2022W

**Relevant SDGs:** SDG12, SDG09

**ECTS:** 2

**Lecturer:** Widmer, Rolf; Widmer, Rolf; Wäger, Patrick Anton; Wäger, Patrick Anton

**Abstract**

The aim of this course is to introduce important concepts, methods and principles for sustainable materials management and to critically reflect their possibilities and limitations. A particular focus will be laid on recycling issues.

**Objective**

Students develop a basic understanding of important concepts, methods and principles for sustainable materials management and become acquainted with their possibilities and limitations.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162033&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 151-0741-00L Sustainable Materials

**Semester:** 2022W

**Relevant SDGs:** SDG12, SDG09

**ECTS:** 4

**Lecturer:** Deillon, Léa; Deillon, Léa

**Abstract**

The lecture addresses the issue of sustainability in manufacturing, focussing on materials. The most used materials, their production and transformation into a product are analysed in terms of energy consumption and emissions. Emphasis is then placed on alternative design strategies which reduce the use of materials and innovative processes which lower energy consumption and emissions.

**Objective**

After this lecture students will be able to:

- Develop a critical thinking of published sustainability data and facts
- Explain where the materials that we use come from, what emissions arise from the different steps of raw material production and product manufacturing
- Determine where significant changes can be brought
- Develop feasible solutions towards a more sustainable use of materials

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164399&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 102-0338-01L Waste Management and Circular Economy

**Semester:** 2022S

**Relevant SDGs:** SDG12, SDG11

**ECTS:** 3

**Lecturer:** Haupt, Melanie Barbara; Warthmann, Rolf Jürgen

### **Abstract**

Understanding the fundamental concepts of advanced waste management and circular economy and, in more detail, on biological processes for waste treatment. Application of concepts on various waste streams, including household and industrial waste streams. Insights into environmental aspects of different waste treatment technologies and waste economy.

### **Objective**

The purpose of this course is to study the fundamental concepts of waste management in Switzerland and globally and learn about new concepts such as Circular Economy. In-depth knowledge on biological processes for waste treatments should be acquired and applied in case studies. Based on this course, you should be able to understand national waste management strategies and related treatment technologies. Treatment plants and valorization concepts for biomass and organic waste should be understood. Furthermore, future designs of waste treatment processes can be evaluated using basic process understanding and knowledge obtained from the current literature.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157933&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 102-0357-00L Waste Recycling Technologies

**Semester:** 2022W

**Relevant SDGs:** SDG12, SDG11

**ECTS:** 3

**Lecturer:** Bunge, Rainer Curt Albert

### **Abstract**

Waste Recycling Technology (WRT) is a sub-discipline of Mechanical Process Engineering. WRT is employed in production plants processing contaminated soil, construction wastes, scrap metal, recovered paper and the like. While WRT is well established in Central Europe, it is only just now catching on in emerging markets as well.

### **Objective**

At the core of this course is the separation of mixtures of solid bulk materials according to physical properties such as color, electrical conductivity, magnetism and so forth. After having taken this course, the students should have concept not only of the unit operations employed in WRT but also of how these unit operations are integrated into the flow sheets of production plants.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163507&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 865-0041-00L Natural Resource Governance and Energy Transition: Policies and Practice

**Semester:** 2022S

**Relevant SDGs:** SDG12, SDG16

**ECTS:** 3

**Lecturer:** Brugger, Fritz

### **Abstract**

First introductory, online phase of an advanced-level multi-stakeholder course with the main goal to introduce analytical tools of political economy to enhance understanding of the crucial impact of politics and power on policy outcomes.

### **Objective**

The first phase of the course will be introductory, allowing participants to start interacting with their peers, access videos and other materials as well as engage in scheduled live sessions to refresh their knowledge and skills.

### **Comment**

Only for CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation.

ETH doctoral students working on topics related to poverty reduction in low- and middle income countries may also be admitted.

Registration only through the NADEL administration office.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164698&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# SDG 13 – Climate Action

## 851-0610-00L The Role of Finance in Tackling Climate Change

**Semester:** 2022S

**Relevant SDGs:** SDG13

**ECTS:** 3

**Lecturer:** Egli, Florian Manuel; Steffen, Bjarne; Stünzi, Anna Helena

### **Abstract**

This course focuses on public policy to leverage finance in tackling climate change. We cover international negotiations as well as the role of governments in designing public policy for different financing actors (e.g. public and private) in developing and OECD countries.

### **Objective**

- Critically examine the role of finance (e.g. public vs private actors) in climate change and the energy transition
- Develop an understanding of the role and design of public policy to direct and mobilize finance
- Find out about current challenges in climate finance with a focus on Switzerland

### **Comment**

Primarily suited for Master and PhD students.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159576&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 701-1563-00L Climate Policy

**Semester:** 2022W

**Relevant SDGs:** SDG13

**ECTS:** 6



**Lecturer:** Hanger-Kopp, Susanne; Patt, Anthony Gooding

### **Abstract**

This course provides an in-depth of analysis both of the theoretical underpinnings to different approaches to climate policy at the international and national levels, and how these different approaches have played out in practice. Students will learn how legislative frameworks have developed over the last 25 years, and also be able to appraise those frameworks critically.

### **Objective**

Climate change is one of the defining challenges of our time, touching all aspects of the environment and of society. There is broad recognition (although with some dissent) that governments ought to do something about it: making sure that emissions of greenhouse gases (GHGs) stop within the next 30 to 40 years; helping people to adapt to the consequences of the climate change to which we have already committed ourselves; and, most controversially, perhaps taking measures to actively remove GHG's from the atmosphere, or to alter the radiation balance of the Earth through solar engineering.

It's a complicated set of problems, especially the first of these, known as mitigation. Fundamentally this is because it means doing something that humanity has never really tried before at a planetary scale: deliberately altering the ways the we produce, convert, and consume energy, which is at the heart of modern society. Modern society – the entire anthropocene – grew up on fossil fuels, and the huge benefits they offered in terms of energy that was inexpensive, easy to transport and store, and very dense in terms of its energy content per unit mass or volume. How to manage a society of over 7 billion people, at anything like today's living standards, without the benefits of that energy, is a question for which there is no easy answer. There are also other challenges outside of energy. How do we build houses, office buildings, and infrastructure networks without cement, a substance that releases large amounts of CO<sub>2</sub> as it hardens? How do we reverse the pace of deforestation, particularly in developing countries? How do we eliminate the GHG emissions from agriculture: the methane from cows' bellies and rice paddies, together with the chemicals that enter the atmosphere from the application of fertilizer?

These are all tough questions at a technical level, but even tougher when you consider that governments typically need to employ indirect methods to get these things to happen. Arguably a government could simply pass a law that forbids people from using fossil fuels. But politically this is simply unrealistic, at least while so many people depend on fossil fuels in their daily lives. What is to be done? For this, one needs to turn to various ideas about how government can and should influence society. On the one hand are ideas suggesting that government ought to play a very limited role, relative to private actors, and should step in only to correct "market failures," with interventions designed specifically around that failure. On the other hand are ideas suggesting that government (meaning all of us, working together through a democratic process) is the appropriate decision-making body for core decisions on where society can and should go. These issues come to the fore in climate policy discussions and debates.

This course is about all that. The goal is to give students a glimpse into the enormous complexity of this policy area, an understanding of some of the many debates that are currently raging (of which the debate about whether climate change is actually real is probably the least complicated or interesting). We want to give students the ability to evaluate policy arguments made by politicians, experts, and academics with a critical eye, informed by a knowledge of history, an understanding of the theoretical underpinnings, and the results of empirical testing of different strategies. A student taking this course ought to be able to step into an NGO or government agency involved in climate policy analysis or political advocacy, and immediately be able to make an informed and creative contribution. Moreover, by experiencing the depth of this policy area, students should be able to appreciate the complexity inherent in all policy areas.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163090&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 052-1107-22L Entwurf V-IX: Thema (N.N.)

**Semester:** 2022W

**Relevant SDGs:** SDG13

**ECTS:** 14

**Lecturer:** to be announced

**Abstract**

Amplitude. Dynamische Landschaftsstrukturen für das Seeland. Die Suche nach zukunftsweisenden Strategien im Umgang mit diesen Extremen bedingt einen Paradigmenwechsel – vom Kämpfen gegen zum Arbeiten mit den natürlichen Prozessen. Es gilt neue Landschaftsstrukturen zu legen, welche mit den Ausschlägen der Amplituden umgehen können.

**Objective**

Grundlegendes Wissen im Landschaftsarchitektur, Entwicklung einer Haltung, Formulierung einer Hypothese, Wahl entsprechender Entwurfselemente, Entwurf und Darstellung komplexer/dynamischer Systeme und Landschaftsräumen, Alternieren zwischen verschiedenen Massstäben.

**Comment**

Die Belegung unter myStudies ist erst nach der Zuteilung der Entwurfsklasse am Schluss der internen Einschreibung am D-ARCH möglich (s. <http://www.einschreibung.arch.ethz.ch/design.php>). Eine Benotung des Entwurfs am Semesterende erfolgt ausschliesslich aufgrund der per Stichtag 1.11.22, 24:00 Uhr, dokumentierten Belegungsliste (= letzter Termin zum Löschen/Belegen der Lehrveranstaltung Entwurf).

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164522&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 651-4168-00L CryoGeoEcology: Snow and Snow Cover Field Course

**Semester:** 2022S

**Relevant SDGs:** SDG13

**ECTS:** 3

**Lecturer:** Schneebeli, Martin Christoph

**Abstract**

In this field course we will study physical and chemical properties of snow and ice as determinants in high altitude ecosystems such as alpine forest ecotones, high-altitude tundra, nival zones, thawing permafrost and newly appearing glacial retreat lakes, flood basins and swamps. Seasonal snow impacts the habitat conditions and thus the responses of organisms.

**Objective**

Introducing cryosphere ecosystems and understanding snow microphysics and chemistry as ecological parameters.

Developing an appreciation for life under extreme conditions and its special adaptations.

Transforming results from small-scale studies to better understand global change phenomena.

Collecting experience during field work and learning lab techniques applied to snow studies.

Practicing guided self-learning and searching for and evaluating scientific literature.

Designing and executing a small project and reporting about its outcome.

**Comment**

Priority is given to ETHZ students. If space is available UZH Geography and Earth System Sciences students may attend this field course at full cost.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=161738&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 701-1252-00L Climate Change Uncertainty and Risk: From Probabilistic Forecasts to Economics of Climate Adaptation

**Semester:** 2022S

**Relevant SDGs:** SDG13

**ECTS:** 3

**Lecturer:** Bresch, David Niklaus; Bresch, David Niklaus; Knutti, Reto; Knutti, Reto

**Abstract**

The course introduces the concepts of predictability, probability, uncertainty and probabilistic risk modelling and their application to climate modeling and the economics of climate adaptation.

**Objective**

Students will acquire knowledge in uncertainty and risk quantification (probabilistic modelling) and an understanding of the economics of climate adaptation. They will become able to construct their own uncertainty and risk assessment models (in Python), hence basic understanding of scientific programming forms a prerequisite of the course.

**Comment**

Number of participants limited to 50.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158671&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 363-1106-00L The Economics of Climate Change

**Semester:** 2022W

**Relevant SDGs:** SDG13

**ECTS:** 3

**Lecturer:** Goussebaïle, Arnaud Jean Philippe

**Abstract**

After an introduction to the issue of climate change, we will see the policy instruments that can be used to mitigate it. We will then discuss the optimal level of these policies. Finally, we will analyze the political constraints that limit their implementation.

**Objective**

Students will acquire a general understanding of the problem faced by the society with climate change, as well as the ways and the obstacles to deal with it. From a technical point of view, this course intends to teach participants the main tools used in economic sciences to discuss the problem of climate change, understand its key determinants, advise policy makers and understand the constraints of the latter.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163800&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 851-0086-00L War between Humans, or War against Nature? Biographical, Social, Political and Scientific Aspects

**Semester:** 2022W

**Relevant SDGs:** SDG13

**ECTS:** 3

**Lecturer:** Del Fabbro, Olivier

### **Abstract**

In the course we read classical texts from the field of philosophy of war (Clausewitz, Hobbes) and compare them to texts about human war against nature (James, Latour), e.g. climate change, pandemics such as Covid-19 or HIV. Important questions are: Is the concept of war only applicable to humans? Is there a difference between politics and nature? Is there a science of war? How is war experienced?

### **Objective**

Students learn about the different types of argumentative texts and their historical context. They learn to understand the descriptive and critical value of texts in regard to the topic of war.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164513&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 701-0023-00L Atmosphäre

**Semester:** 2022W

**Relevant SDGs:** SDG13

**ECTS:** 3

**Lecturer:** Fischer, Erich Markus; Peter, Thomas

### **Abstract**

Grundlagen der Atmosphäre, physikalischer Aufbau und chemische Zusammensetzung, Spurengase, Kreisläufe in der Atmosphäre, Zirkulation, Stabilität, Strahlung, Kondensation, Wolken, Oxidationspotential und Ozonschicht.

### **Objective**

Verständnis grundlegender physikalischer und chemischer Prozesse in der Atmosphäre. Kenntnis über die Mechanismen und Zusammenhänge von: Wetter - Klima, Atmosphäre - Ozeane - Kontinente, Troposphäre - Stratosphäre. Verständnis von umweltrelevanten Strukturen und Vorgängen in sehr unterschiedlichem Massstab. Grundlagen für eine modellmässige Darstellung komplexer Zusammenhänge in der Atmosphäre.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163984&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 701-0412-00L Klimasysteme

**Semester:** 2022S

**Relevant SDGs:** SDG13

**ECTS:** 3

**Lecturer:** Gudmundsson, Lukas; Seneviratne, Sonia Isabelle

**Abstract**

Die wichtigsten physikalischen Komponenten des Klimasystems und deren Wechselwirkungen werden eingeführt. Vor dem Hintergrund der Klimageschichte - und Variabilität werden die Mechanismen des anthropogenen Klimawandels analysiert. Absolvierende des Kurses sind in der Lage, einfache Problemstellungen aus dem Bereich der Klimasysteme zu identifizieren und erläutern.

**Objective**

Studierende können:

- die wichtigsten physikalischen Komponenten des globalen Klimasystems beschreiben und ihre Wechselwirkungen skizzieren.
- die Mechanismen des anthropogenen Klimawandels erklären.
- einfache Problemstellungen aus dem Bereich der Klimasysteme identifizieren und erläutern.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158725&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 363-1164-00L Topics in Energy and Climate Policy

**Semester:** 2022S

**Relevant SDGs:** SDG13, SDG07

**ECTS:** 1.5

**Lecturer:** Filippini, Massimo; Srinivasan, Suchita

**Abstract**

The seminar offers students the possibility to deepen their knowledge on energy and climate policy issues by presenting and discussing some scientific papers that analyse the economic aspects of energy and climate policy instruments.

**Objective**

After taking this course, students will be able to:

- Engage in, participate and learn from discussion on the design, implementation and effectiveness of energy and climate policy instruments.
- Read, present and discuss scientific papers that analyse issues in energy and climate policy critically.

**Comment**

Participation is limited to 20 students. A mandatory prerequisite is to attend the Energy Economics and Policy course offered by MTEC in FS 2022.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=160198&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 227-0803-00L Energy, Resources, Environment: Risks and Prospects

**Semester:** 2022S

**Relevant SDGs:** SDG13, SDG07, SDG15

**ECTS:** 6

**Lecturer:** Flüeler, Thomas; Zenklusen, Oliver

**Abstract**

Multidisciplinary, interactive course focusing on the complexity of environmental and energy problems. Concepts of risk theory, decision science, long-term governance and environmental economics are applied to case studies related to energy transition and climate change. The course is designed for a multidisciplinary audience and as a training ground for critical thinking.

**Objective**

Develop capacities for addressing environmental problems, scrutinising proposed solutions and contributing to debates across disciplines. Analyse complex issues from different perspectives. Understand interactions between the environment, science and technology, society and economy. Develop skills in critical thinking, scientific writing and presenting.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158249&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 363-1116-00L Climate Finance

**Semester:** 2022S

**Relevant SDGs:** SDG13, SDG08

**ECTS:** 3

**Lecturer:** Stolbova, Veronika

**Abstract**

The course focuses on understanding the impact of climate change on the financial system and the impact of the financial system on climate change. It addresses how firms, banks, governments,

insurances and pension funds invest in climate-related financial assets, what are the risks and returns associated with them, and how climate policies impact financial assets and financial stability.

### **Objective**

The objectives of this course are threefold. First, it aims to provide participants with an overview of the state-of-the-art situation in matters of the impact of climate on finance and the impact of finance on the environment. Second, it introduces current challenges in the fields of sustainable finance, environmental finance and climate finance, and familiarizes participants with existing methods to solve these challenges. Third, it equips participants with knowledge and tools in climate-finance data analysis which could be applied to the real-world cases by calculating climate-related risks and gains for specific market players.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158138&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 865-0010-01L Environment, Natural Resources and Climate Change

**Semester:** 2022W

**Relevant SDGs:** SDG13, SDG12

**ECTS:** 3

**Lecturer:** Neve, Jasmine Susan

### **Abstract**

Degradation of the environment and non-sustainable use of natural resources, including land, water, forests and biodiversity is threatening individual livelihoods as well as local, national and international economies. This lecture series will address conflicts related to unsustainable resource use and discuss trade-offs between environmental sustainability and economic development.

### **Objective**

The student will be able to

- describe the current status and threats of natural resource use and environmental degradation
- portray the management of natural resources such as land, forest, water, and biodiversity in different contexts and discuss the key challenges in each sector
- examine the implications of climate change on development and the sustainable management of natural resources
- analyze conflicts and trade-offs between natural resource use and economic development
- discuss the global priorities relating to human-induced changes to the environment, and how these can be met

### **Comment**

Nur für MAS in Entwicklung und Zusammenarbeit.



**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163831&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 151-0928-00L CO2 Capture and Storage and the Industry of Carbon-Based Resources

**Semester:** 2022S

**Relevant SDGs:** SDG13, SDG12

**ECTS:** 4

**Lecturer:** Bardow, André; Becattini, Viola; Eckle, Petrisa Roberta; Gruber, Nicolas Patrick; Mazzotti, Marco; Repmann, Mischa; Schmidt, Tobias Sebastian Phillip; Sutter, Daniel

**Abstract**

This course introduces the fundamentals of carbon capture, utilization, and storage and related interdependencies between technosphere, ecosphere, and sociosphere. Topics covered: origin, production, processing, and resource economics of carbon-based resources; climate change in science & policies; CC(U)S systems in power & industrial plants; CO<sub>2</sub> transport & storage.

**Objective**

The lecture aims to introduce carbon dioxide capture, utilization, and storage (CCUS) systems, the technical solutions developed so far, and current research questions. This is done in the context of the origin, production, processing, and economics of carbon-based resources and of climate change issues. After this course, students are familiar with relevant technical and non-technical issues related to the use of carbon resources, climate change, and CCUS as a mitigation measure.

The class will be structured in 2 hours of lecture and one hour of exercises/discussion.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158038&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 102-0004-00L Einführung Umweltingenieurwissenschaften

**Semester:** 2022W

**Relevant SDGs:** SDG13, SDG15

**ECTS:** 3

**Lecturer:** Burlando, Paolo; Hajnsek, Irena; Hellweg, Stefanie; Maurer, Max; Molnar, Peter; Morgenroth, Eberhard Friedrich; Sperger, Katharina; Stocker, Roman; Wang, Jing

### **Abstract**

In dieser Lehrveranstaltung wird den Studierenden vorgestellt, wie Umweltprobleme in den Bereichen Wasserquantität und -qualität, Abfallerzeugung und -recycling, Luftreinhaltung formuliert und mit ingenieurwissenschaftlichen Methoden gelöst werden. Der Kurs stellt in sechs thematischen Bereichen eine Verbindung zwischen der theoretischen Bachelor-Grundlagenfächer und praktischen Themen der Umwelti

### **Objective**

Nach Abschluss dieses Kurses ist der/die Student/in in der Lage:

- zentrale globale Umweltprobleme zu formulieren
- eine Systemperspektive und Problemlösungen entwickeln (kritisches Denken)
- einfache numerische Probleme in den Domänenbereichen erkennen und lösen
- verstehen warum/wie Daten/Modelle in der Umweltingenieurwissenschaften benutzt verwenden
- eigenes Interesse an den Domänenbereichen entwickeln und Karrieremöglichkeiten erkennen

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164403&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 865-0066-03L Disaster Risk Reduction: Assessing Risks and Enhancing Resilience

**Semester:** 2022S

**Relevant SDGs:** SDG13, SDG15

**ECTS:** 1

**Lecturer:** Neve, Jasmine Susan

### **Abstract**

Tackling disaster risks that arise from natural hazards is a pressing global challenge. Disaster Risk Reduction (DRR) is a systematic approach to identifying and assessing the hazards that trigger disasters, with the aim of reducing vulnerabilities. The course introduces the risk landscape countries face, presents concepts and instructive case studies, and uses CEDRIG as a tool for DRR.

### **Objective**

Tackling disaster risks that arise from climate variability, climate change, environmental degradation and natural hazards is widely perceived as one of the greatest current global challenges. Developing countries are particularly vulnerable to disaster risks due to their high dependence on natural resources and their limited coping capacity. The numbers and severity of disasters are on the rise, posing an increasing challenge to sustainable development, and seriously undermining core development priorities such as poverty alleviation.

Disaster Risk Reduction (DRR) is a systematic approach to identifying, assessing and reducing the impact natural disasters might have on projects, programs and strategies. It provides a framework to address the hazards that trigger disasters and aims to reduce socio-economic vulnerabilities.

The course will introduce the risk landscape developing countries are facing, present background knowledge on DRR concepts and terminology, and use instructive case studies on integrated DRR projects. Participants will learn to systematically assess risks, vulnerabilities, and how to enhance resilience in communities by applying tools such as the Climate, Environment and Disaster Risk Reduction Integration Guidance (CEDRIG).

#### **Comment**

Only for MAS/CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation. Doctoral students dealing with empirical research in the area of development and cooperation (EZA) may be admitted "sur Dossier".

Registration only through the NADEL administration office.

#### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159823&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 061-0122-00L Entwerfen mit Pflanzen III

**Semester:** 2022S

**Relevant SDGs:** SDG13, SDG15

**ECTS:** 3

**Lecturer:** Vogt, Günther

#### **Abstract**

Die Mehrheit der derzeit existierenden fremde Baumarten wurden zwischen dem 17. und dem 19. Jahrhundert in Europa eingeführt und haben somit neue landschaftsarchitektonische Typologien mitverursacht. Die Vorlesung bietet einen Überblick über diesen Pflanzenarten sowie einen Ausblick auf deren Potenziale in einer sich schnell verändernden klimatischen Situation.

#### **Objective**

Die Ursprünge der aktuellen Vielfalt europäischer Pflanzenarten und ihre Zusammensetzung reichen weit zurück. Doch aufgrund des Klimawandels und der vom Menschen verursachten Prozesse haben viele Ökosysteme nicht mehr genügend Zeit sich den schnellen Veränderungen anzupassen, was ganze Ökosysteme gefährden kann.

Ziel der Vorlesung ist es, eine Bestandesaufnahme der häufigsten in europäischen Wäldern sowie in Arboreten und botanischen Gärten vorkommenden gebietsfremden Pflanzenarten durchzuführen sowie deren Bestandesumfang, geografische Verbreitung und geografische Herkunft zu analysieren.

#### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=160379&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

# SDG 14 – Life Below Water

## 701-0401-00L Hydrosphäre

**Semester:** 2022S

**Relevant SDGs:** SDG14

**ECTS:** 3

**Lecturer:** M. H. Schroth, R. Kipfer

### **Abstract**

The course aims to describe the relevant processes that control the terrestrial water cycle. Energy and mass exchange, mixing and transport processes are described and the coupling of the hydrosphere with the atmosphere and the solid Earth are discussed.

### **Objective**

Qualitative and quantitative understanding on how physical (and geochemical) processes control the natural dynamics in groundwater, lakes and oceans and constrain the exchange of mass and energy.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lang=en&semkez=2022S&ansicht=KATALOGDATEN&lerneinheitId=158659&>

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## 701-0426-00L Modelling Aquatic Ecosystems

**Semester:** 2022S

**Relevant SDGs:** SDG14

**ECTS:** 3

**Lecturer:** N. I. Schuwirth, P. Reichert

### **Abstract**

Knowledge about processes in aquatic ecosystems will be compiled to mathematical models of such systems. This integration of knowledge stimulates understanding across disciplines and makes it

possible to evaluate hypotheses. The participants will be confronted with ecosystem models of increasing complexity and apply them practically based on an implementation in R.

### **Objective**

Students are able to

- describe the most important biological, biochemical, chemical and physical processes in aquatic ecosystems in the form of mathematical models;
- recognise and explain the interaction of processes in aquatic ecosystems and estimate the resulting behaviour of the entire system;
- mathematically describe important sources of stochasticity and uncertainty in model predictions and quantify their influence on model results;
- formulate models of aquatic ecosystems, implement them in a programming environment and use them to address problems in practice.

### **Comment**

Number of participants limited to 24.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?semkez=2022S&ansicht=KATALOGDATEN&lerneinheitId=157897&lang=de>

# SDG 15 – Life on Land

## 701-1631-00L Foundations of Ecosystem Management

**Semester:** 2022W

**Relevant SDGs:** SDG15

**ECTS:** 5

**Lecturer:** Garcia Ulloa, John Alejandro; Garcia, Claude Antoine; Ghazoul, Jaboury; Giger Dray, Anne Pauline

### **Abstract**

This course introduces the broad variety of conflicts that arise in projects focusing on sustainable management of natural resources. It explores case studies of ecosystem management approaches and considers their practicability, their achievements and possible barriers to their uptake.

### **Objective**

Students should be able to

- a) propose appropriate and realistic solutions to ecosystem management problems that integrate ecological, economic and social dimensions across relevant temporal and spatial scales.
- b) identify important stakeholders, their needs and interests, and the main conflicts that exist among them in the context of land and resource management.

### **Comment**

Number of participants is limited to 35. Priority is given to the target groups until 26.09.2022. Target groups: MAS ETH in Raumplanung, MAS ETH in Sustainable Water Resources Science, Technology and Policy MSc, Environmental Sciences MSc, and Agricultural Sciences MSc. Waiting list will be deleted on 30.09.2022

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163394&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 701-0301-00L Angewandte Systemökologie

**Semester:** 2022W

**Relevant SDGs:** SDG15

**ECTS:** 3

**Lecturer:** Gessler, Arthur Martin

**Abstract**

Dieser Kurs vertieft das ökologische Systemwissen, das nötig ist, um angewandte Lösungen für aktuelle Umweltprobleme zu hinterfragen. Unser zentrales Anliegen ist es, den Respekt der Teilnehmer vor Komplexität mit einem Sinn für Möglichkeiten zu balancieren, indem wir Beispiele aus dem weiten Lösungsraum ökologischer Systeme darstellen, wie z.B. grüne Infrastruktur im Wassermanagement.

**Objective**

Am Ende der Vorlesung...

...können Sie Ihre Recherche strukturieren und Sie wissen, wie Sie ein komplexes Umweltproblem analysieren können. Sie können die lösungs-relevanten Fragen formulieren und Antworten finden (unterstützt durch Diskussionen, Input der Dozenten und aus der Literatur), und Sie können Ihre Schlussfolgerungen klar und sorgfältig darstellen.

...verstehen Sie die Komplexität der Interaktionen und Strukturen in Ökosystemen. Sie wissen wie Ökosystemprozesse, Funktionen und Dienste interagieren und sich über vielfältige Raum- und Zeitskalen hinweg beeinflussen (im Allgemeinen, und im Detail für einige ausgewählte Beispiele).

...verstehen Sie, dass Biodiversität und die Interaktionen zwischen Organismen ein integraler Bestandteil von Ökosystemen sind. Ihnen ist bewusst, dass die Verbindung zwischen Biodiversität und Prozess/Funktion/Dienst selten vollständig verstanden ist. Sie wissen wie man aufrichtig mit diesem Verständnismangel umgeht und können dennoch Lösungswege finden, kritisch analysieren und darstellen.

...verstehen Sie die Wichtigkeit von Ökosystemdiensten für die Gesellschaft.

...haben Sie einen Überblick über die Methoden in der Ökosystemforschung und einen tieferen Einblick in einige ausgewählte Techniken z.B. in die ökologische Beobachtung, Manipulation und Modellierung.

...haben Sie sich mit der Ökologie als junge und zentrale Disziplin für drängende angewandte Gesellschaftsfragen auseinandergesetzt.

**Comment**

Die Teilnehmerzahl ist auf 35 Studierende beschränkt. Die Warteliste wird am 02.10.2022 gelöscht.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=161890&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

# 701-1635-00L Multifunctional Forest Management

**Semester:** 2022W

**Relevant SDGs:** SDG15

**ECTS:** 5

**Lecturer:** Lévesque, Mathieu; Zimmermann, Karl Stephan

## **Abstract**

Forests provide a variety of ecosystem goods and services. Multifunctional forest management attempts to control natural processes in a sustainable and near-natural way so that various requirements from the society can be met. Adaptivity to changing conditions (global changes), handling of conflicting goals and the development of alternative management strategies are of central importance.

## **Objective**

At the end of this course participants will be able:

- To describe forest management and silvicultural measures for enhancing forest resilience to climate change, increased disturbances, and invasive species, and evaluate their feasibility and effectiveness in various situations;
- To concisely describe silvicultural options for the management of multifunctional forests and critically evaluate their feasibility and suitability;
- To explain the various social expectations towards forest ecosystem services and their implications for multifunctional forest management and critically analyse conflicts and synergies resulting from different forest ecosystem services;
- To carry out research on a given topic, identify relevant literature and present the results in a structured presentation and discuss the implications for forest management.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164046&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 701-0324-00L Rain Forest Ecology

**Semester:** 2022S

**Relevant SDGs:** SDG15

**ECTS:** 2

**Lecturer:** Giger Dray, Anne Pauline; Kettle, Christopher James; Kleinschroth, Fritz



### **Abstract**

Tropical rain forests host most of the world's terrestrial biodiversity, are critical to global climate, and support livelihoods of billions of people. We use a transdisciplinary lens to understanding the impact of management and land use change on resilience of tropical forest landscapes, their restoration and capacity to deliver multiple ecosystem services and support sustainable development.

### **Objective**

The course learning objectives are organized in two main sections:

Importance and complexity of Tropical rainforest and why study them

1. Explore the diversity and functioning of one of the world's most important biomes: tropical rain forests.
2. Understand how interacting ecological processes acting over multiple time and spatial scales can shape patterns of species diversity.
3. Explore how species, functional groups and environment interact to shape rain forest structure and function.

Conservation, management and opportunities to restore tropical rain forest landscapes:

4. Recognize and understand the complexity of threats facing rain forests and their implications to human wellbeing.
5. Apply ecological theory and ecosystem understanding to current conservation challenges.
6. Understand conservation and land management strategies especially forest landscape restoration in the tropics and evaluate the conditions for their success
7. Explore innovative solutions to shape sustainable forest landscapes in the future.

A primary objective of the course is to encourage students to use basic ecological knowledge to infer conclusions and evaluate strategies that address more applied environmental challenges. In so doing students would be encouraged to draw upon the ecological knowledge gained from this course, but also from other courses in ecology, ecological genetics, ecosystem function, conservation, agriculture and land use.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158344&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 701-0371-00L Ecosystem Conservation and Restoration

**Semester:** 2022W

**Relevant SDGs:** SDG15

**ECTS:** 3

**Lecturer:** Crowther, Thomas Ward; Ghazoul, Jaboury; Maynard, Daniel Senn

**Abstract**

Conservation and restoration are interdisciplinary sciences that nonetheless are founded on fundamental ecological concepts. The course will explore theoretical underpinnings of conservation and restoration science that inform planning and implementation, and consequent outcomes. New concepts and emerging technologies will be explored, alongside case studies that inform discussions.

**Objective**

Through the course, students will:

- Understand the theoretical underpinnings of conservation and restoration science.
- Consider alternative conservation concepts and approaches, and the role of science and evidence in implementing these ideas in practice.
- Appraise different conservation strategies, drawing on case studies and examples from around the world.
- Explore new and emerging technologies that can be useful to guide responsible decision making in land management decisions.
- Evaluate the future direction of conservation science, in terms of new concepts (resilience, restoration, rewilding, natural capital, de-extinction) and emerging technologies (remote sensing, AI, genetics).
- Explore conservation and restoration science and practice in the context of current societal pressures, and the prospects for biodiversity conservation in coming decades.
- Understand how responsible restoration and conservation goals should integrate local practices, customs, cultures, and economic requirements.

In this course, students will:

- Learn about the historical development of thinking in conservation and restoration ecology
- Learn about the ecological theories underpinning conservation and restoration ecology
- Learn about emerging statistical and analytical tools to guide effectively responsible conservation and restoration initiatives
- Learn about the practical challenges and trade-offs in decision making that ultimately govern the success of conservation and restoration challenges around the world
- Understand, through the exploration of case studies and site visits, differing normative and management perspectives on landscape scale conservation and restoration

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=165118&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

## 701-0518-00L Bodenressourcen und Global Change

**Semester:** 2022S

**Relevant SDGs:** SDG15

**ECTS:** 3

**Lecturer:** Dötterl, Sebastian; Meusbürger Di Bella, Katrin

### **Abstract**

Einführung in Bedeutung, Problemstellungen und Konzepte des Themas Bodenentwicklung und der Nutzung von Bodenressourcen in einer Welt im Wandel. Wir behandeln hierbei die Thematik mit Beispielen aus dem globalen, europäischen und Schweizer Kontext.

### **Objective**

Verständnis der

- globale Rahmenbedingungen unter denen Böden sich entwickeln und genutzt werden
- Folgen und Probleme der Nutzung von Böden und die daraus entstehenden Belastungen und Gefahren für Bodenressourcen
- Folgen des Klima- und Landnutzungswandels auf die Entwicklung von Bodenressourcen
- Kompetenzen zu Prozessverständnis, Systemverständnis sowie Datenanalyse und Interpretation in der bodenkundlichen Forschung werden gelehrt und geprüft.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158060&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 701-0567-00L Waldgesundheit: Entomologie und Pathologie

**Semester:** 2022S

**Relevant SDGs:** SDG15

**ECTS:** 3

**Lecturer:** Brockerhoff, Eckehard Gustav; Brockerhoff, Eckehard Gustav; Queloz, Valentin Camille Walter; Queloz, Valentin Camille Walter

### **Abstract**

Insekten und Mikroorganismen sind wichtige Komponenten der Biodiversität und der Ökologie der Wälder. Diese Lehrveranstaltung behandelt die Vielfalt, Biologie und Ökologie der Insekten und Pathogene, insbesondere der einheimischen und gebietsfremden Baumschädlinge und Krankheitserreger, sowie entomologische und pathologische Methoden, Waldschutz und weitere relevante Themen.

### **Objective**

Grundlagen und Kenntnis:

- der Biologie, Ökologie und Biodiversität der Insekten sowie der Insektenordnungen mit Beispielen von «Nützlingen» und «Schädlingen» der Waldbäume und Wälder Mitteleuropas.
- der verschiedenen Gruppen von Pathogenen (Pilze, Oomyceten, Bakterien, Viren) sowie abiotischen Ursachen von Baumkrankheiten.
- der wichtigsten Konzepte wie Waldgesundheit, Prädisposition, Resistenz, Resilienz, Interaktionen, Vektoren, Epidemiologie, Massenvermehrung, invasive Arten, und klimatische Faktoren.
- der Methoden zum Monitoring und der nachhaltigen Vorbeugung und Begrenzung von Schäden durch Insekten und Pathogene.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163038&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 078-0204-00L Regenerative Landscapes: Rule-Based Design

**Semester:** 2022S

**Relevant SDGs:** SDG15

**ECTS:** 3

**Lecturer:** Galí-Izard, Teresa Eulalia

### **Abstract**

Students will be introduced to methods and tools from regenerative agriculture and how they can be integrated into the discipline and practice of landscape architecture and territorial design. Traditional and contemporary approaches in designing with productive living systems will be critically discussed, including agroforestry, water harvesting, companion planting, and pasture cropping.

### **Objective**

An introduction to the strategies of regenerative agriculture will enable students to develop an understanding of key ecological parameters for design involving water, soil, animals, and vegetation. Students learn how to identify key components of a landscape system, understand relatively why and how they work, and abstract that information in drawings and diagrams that become useful for design.

Additionally, the course will examine the potentials and challenges of these practices to influence landscapes at a territorial scale.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159475&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 701-0747-00L Umweltpolitik der Schweiz

**Semester:** 2022W

**Relevant SDGs:** SDG15

**ECTS:** 3

**Lecturer:** Lieberherr, Eva Katharina

**Abstract**

Der Kurs vermittelt die Grundlagen der Politikfeldanalyse (Public Policy Analyse) sowie die spezifischen Charakteristika der Schweizer Umweltpolitik. Politikinstrumente, Akteure und Prozesse werden aus Sicht der Politikwissenschaften sowohl theoretisch wie auch anhand aktueller Beispiele der Schweizer Umweltpolitik empirisch aufgezeigt.

**Objective**

Nebst der Aneignung von Grundkenntnissen der Politikfeldanalyse trägt die Lehrveranstaltung dazu bei, sich mit aktuellen und konkreten Fragestellungen der Umweltpolitik auf analytische Weise auseinander zu setzen. Anhand von Übungen werden den Teilnehmer/-innen politikwissenschaftliche Konzepte und Analyseansätze sowie reale Entscheidungsprozesse näher gebracht. Die fundierte Auseinandersetzung mit komplexen politischen Konfliktsituationen ist eine wichtige Voraussetzung für den Einstieg in die (umweltpolitische) Praxis bzw. eine zukünftige wissenschaftliche Forschungstätigkeit.

**Comment**

Die Teilnehmerzahl ist auf 130 Studierende beschränkt.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162081&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 701-0405-00L Binnengewässer: Konzepte und Methoden für ein nachhaltiges Management

**Semester:** 2022W

**Relevant SDGs:** SDG15, SDG06

**ECTS:** 3

**Lecturer:** Fink, Sabine Franziska; Scheidegger, Christoph; Weber, Christine; Weitbrecht, Volker

**Abstract**

In diesem Kurs werden Binnengewässer-Ökosysteme, ihre grundlegenden ökologischen Eigenschaften, sowie ihre anthropogenen Beeinflussungen und Veränderungen behandelt. Anhand von Fallbeispielen werden Konzepte und Methoden zum nachhaltigen Management diskutiert. Die Fallbeispiele stammen meistens aus der Schweiz und nehmen Bezug zum Gewässerschutzgesetz und der Strategie Biodiversität Schweiz.

**Objective**

Grundlagen zur Funktionsweise der wichtigsten Binnengewässer-Ökosysteme

- Grundlagen des nachhaltigen Managements aquatischer Ökosysteme
- Anwendung dieser Prinzipien auf Fallbeispiele
- Kritische Analysen, Organisation in Diskussionsgruppen

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164050&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 701-1679-00L Landscape Modelling of Biodiversity: From Global Changes to Conservation

**Semester:** 2022W

**Relevant SDGs:** SDG15, SDG13

**ECTS:** 5

**Lecturer:** Graham, Catherine Helen; Pellissier, Loïc; Zimmermann, Niklaus

**Abstract**

The course provides the student with the spatial tools to address societal challenges toward ensuring the sustainable use of terrestrial ecosystems and the conservation of biodiversity. Students learn theory, tools and models during a few introductory sessions and apply this knowledge to solve a practical problem in groups related to climate change, land use change and biodiversity conservation.

**Objective**

Students learn:

- Theoretical foundations of the species ecological niche
- Biodiversity concepts and global change impacts

- Basic concepts of spatial (& macro-) ecology
- Environmental impact assessment and planning
- Advanced statistical methods (GLM, GAM, CART) and basic programming (loops, functions, advanced scripting) in the statistical environment R.
- The use of GIS functionality in R

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=161912&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 860-0023-00L International Environmental Politics

**Semester:** 2022W

**Relevant SDGs:** SDG15, SDG13

**ECTS:** 3

**Lecturer:** Bernauer, Thomas

**Abstract**

This course focuses on the conditions under which problem solving efforts in international environmental politics emerge and the conditions under which such efforts and the respective public policies are effective.

**Objective**

The objectives of this course are to (1) gain an overview of relevant questions in the area of international environmental politics from a social sciences viewpoint; (2) learn how to identify interesting/innovative questions concerning this policy area and how to answer them in a methodologically sophisticated way; (3) gain an overview of important global and regional environmental problems and how they could be solved.

**Comment**

Besonders geeignet für Studierende D-ITET, D-USYS

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163065&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 701-1562-00L Principles of Management for Sustainability

**Semester:** 2022S

**Relevant SDGs:** SDG15, SDG13

**ECTS:** 6

**Lecturer:** Lieberherr, Eva Katharina; Patt, Anthony Gooding

## **Abstract**

The course will proceed through a series of management concepts that will be applied to environmental case studies. Students will engage in individual and group work to practice the art of effective management, recommending a course of action for the individual and organization that is the subject of each case, gaining valuable insights into environmental management.

## **Objective**

- Identify the facts, assumptions, theories, and social constructions guiding the management of organizations and decision-making to a range of environmental and natural resource policy problems.
- Recognize key institutional and interpersonal challenges in management and decision-making situations.
- Design communication and decision-making processes that can work effectively in the context of stakeholder worldviews and perspectives.
- Conduct qualitative and quantitative analysis of value to decision-makers, and communicate that in a manner that is clear and effective.
- Consider broader policy issues applicable across the cases, such as the appropriate roles of public, non-profit, and private sector organizations, the decentralization of authority, and possible societal pathways towards sustainability.

## **Comment**

Maximale Teilnehmerzahl: 40

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157243&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# 701-1646-00L Carbon and Nutrient Cycling under Global Change

**Semester:** 2022S

**Relevant SDGs:** SDG15, SDG13



**ECTS:** 5

**Lecturer:** Crowther, Thomas Ward; Dötterl, Sebastian; Hagedorn, Frank

**Abstract**

The course covers the pools and fluxes of carbon and nutrients across various types of ecosystems and landscapes and how they are affected by changing climate and land-use. Specifically, the course explores carbon and nutrient cycling: (i) in vegetation and soils at the plot to global scale; (ii) the role of soil properties as controls; and (iii) the effects of climate change and land management.

**Objective**

The participants learn to identify, analyze and propose solutions for problems and research questions associated with land management and climate change effects on carbon and nutrient cycling in various ecosystems and landscapes. A variety of experimental data will be presented from stemming from ongoing research projects of the involved lecturers. Analyses of this data encompasses a range of statistical approaches which are widely used in environmental research.

**Comment**

Number of participants limited to 25.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158393&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 701-1651-00L Environmental Governance

**Semester:** 2022W

**Relevant SDGs:** SDG15, SDG13

**ECTS:** 6

**Lecturer:** Lieberherr, Eva Katharina

**Abstract**

The course addresses environmental policies, focusing on new steering approaches, which are generally summarized as environmental governance. The course also provides students with tools to analyze environmental policy processes and assesses the key features of environmental governance by examining various practical environmental policy examples.

**Objective**

To understand how an environmental problem may (not) become a policy and explain political processes, using basic concepts and techniques from political science.

To analyze the evolution as well as the key elements of environmental governance.

To be able to identify the main challenges and opportunities for environmental governance and to critically discuss them with reference to various practical policy examples.

### Comment

Number of participants is limited to 30. Priority is given to the target groups until 19.09.2022. Target groups: Environmental Sciences MSc and Agricultural Sciences MSc. Waiting list will be deleted on 23.09.2022

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162253&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 701-0703-00L Ethik und Umwelt

**Semester:** 2022W

**Relevant SDGs:** SDG15, SDG13

**ECTS:** 2

**Lecturer:** Deplazes Zemp, Anna

### Abstract

Die drängenden Umweltherausforderungen der heutigen Zeit verlangen nach einer kritischen Reflexion. Ethik ist ein wichtiges Instrument dazu. Diese Vorlesung führt in die Grundlagen der Ethik ein und vermittelt vertiefte Kenntnisse der umweltethischen Debatten. Diese werden mit Bezug auf die heute drängenden Umweltherausforderungen vertieft und kritisch reflektiert.

### Objective

Nach dem Besuch der Vorlesung haben Sie die Fähigkeit erworben, ethische Herausforderungen generell und spezifisch im Bereich der Umwelt zu identifizieren, zu analysieren, kritisch zu reflektieren und einer Lösung zuzuführen. Sie kennen dafür grundlegende umweltethischer Grundbegriffe, Positionen und Argumentationlinien, die Sie in kleineren Übungen erprobt und hinterfragt haben.

### VVZ Link

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163610&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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## 701-1600-00L Summer School on Forest Research and Global Change

**Semester:** 2022S

**Relevant SDGs:** SDG15, SDG13

**ECTS:** 2

**Lecturer:** Born, Julia Emmanuela; Bugmann, Harald; Gessler, Arthur Martin

**Abstract**

This summer school highlights various aspects of forest resilience, the

provisioning of ecosystem services under changing environmental and socioeconomic boundary conditions, and the interactions between society and ecology. It is aimed primarily for PhD students to bring themselves up to date with the latest research, to share their research and to network with peers from all around the world.

**Objective**

The goal of the Summer School is to provide an in-depth understanding of the concepts, approaches to maintain ecosystem services under changing environmental and societal boundary conditions. Students will obtain a deeper understanding of the interactions between, ecology, management and socio-economic boundary conditions. They will gain knowledge of novel modelling and monitoring approaches and they will be able to discuss them considering the expectations on future forests from a scientific, forest

management, and socio-economic perspective.

The participants will reflect on their own work (master, PhD studies) with respect to other disciplines and discuss possible benefits of interdisciplinary approaches in their field.

Ultimately, the participants will get to know the interfaces of their own

research with other methods and approaches. This will increase the impact

and the relevance of their own work.

**Comment**

All registrations are put on a waiting list; manual selection of candidates is performed according to the criteria mentioned under "Prerequisites".

Students will be informed by mid of May if participation is possible.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159115&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 701-1653-00L Policy and Economics of Ecosystem Services

**Semester:** 2022S

**Relevant SDGs:** SDG15, SDG13

**ECTS:** 3

**Lecturer:** Garrett, Rachael Devorah

**Abstract**

The course addresses ecosystem services, their value for society, the causes of their degradation, the stakeholders involved in their provision and use, and policies to reduce their degradation. One focus is on environmental economics approaches, highlighting their potential and limitations. During the spring of 2021 this course will focus on these issues through the case of the Brazilian Amazon.

**Objective**

Students can describe, analyse and explain

- the basic concepts used to describe ecosystem services provision and management;
- the basic social and natural science theory underlying ecosystem service degradation,
- the role and characteristics of different key stakeholders involved in ecosystem services management, including their different value systems;
- the different types of policy instruments and institutional arrangements that can be used for improved ecosystem services management and provision; and
- empirical tools to assess the performance of various policy instruments and management systems for ecosystem services provision, and to investigate the factors of success or failure of different policy instruments

**Comment**

Number of participants limited to 50.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=157730&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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# SDG 16 – Peace, Justice & Strong Institutions

## 857-0004-00L Political Economy

**Semester:** 2022W

**Relevant SDGs:** SDG16

**ECTS:** 8

**Lecturer:** Bernauer, Thomas; Koubi, Vassiliki

### **Abstract**

This seminar focuses on the interplay of political and economic factors in shaping policy outcomes at local to global levels. It concentrates on the application of economic logic to political questions and the influence of political processes and institutions on economic activity.

### **Objective**

This seminar focuses on the interplay of political and economic factors in shaping policy outcomes at local to global levels. It concentrates on the application of economic logic to political questions and the influence of political processes and institutions on economic activity.

### **Comment**

Only for MA Comparative and International Studies.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158880&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 853-0010-01L Konfliktforschung II: Bürgerkriege (ohne Übungen)

**Semester:** 2022S

**Relevant SDGs:** SDG16

**ECTS:** 3

**Lecturer:** Cederman, Lars-Erik; Juon, Andreas

**Abstract**

Einführung in die Bürgerkriegsforschung. Der Kurs behandelt die Ursachen, Prozesse und Lösungen innerstaatlicher Konflikte und Bürgerkriege.

**Objective**

- Kenntnisse verschiedener Ursachen von Bürgerkriegen.
- Kenntnisse der Prozesse während Bürgerkriegen.
- Kenntnisse verschiedener Lösungen und Strategien zur Beendigung von Bürgerkriegen.
- Anwendung der Theorien auf aktuelle Bürgerkriege.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=158810&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 853-0015-01L Konfliktforschung I: Politische Gewalt (ohne Übungen)

**Semester:** 2022W

**Relevant SDGs:** SDG16

**ECTS:** 3

**Lecturer:** Juon, Andreas

**Abstract**

Einführung in die Forschung zu politischer Gewalt im nationalen und internationalen Kontext. Der Kurs behandelt die Ursachen und Lösungen verschiedener Typen politischer Gewalt, wie zwischenstaatliche Kriege, Bürgerkriege, Terrorismus oder soziale Proteste.

**Objective**

Kenntnisse verschiedener Typen politischer Gewalt und ihrer Ursachen.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=162837&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 865-0021-00L Fraud and Corruption: Prevent, Detect, Investigate, Sanction

**Semester:** 2022W

**Relevant SDGs:** SDG16

**ECTS:** 1

**Lecturer:** Hensgen, Leonie; Schmid-Huberty, Matthias Johannes

## **Abstract**

The course examines forms, causes and effects of fraud and corruption in developing countries. Participants receive an introduction to the main concepts and mechanisms of prevention, detection, investigation and sanctioning. By using practical examples, the course prepares participants for dealing with fraud and corruption related issues in the context of development projects.

## **Objective**

Participants are able to describe and reflect on different forms, causes and effects of fraud and corruption in the context of development cooperation. Based on common concepts and mechanisms of the international community they are able to apply and differentiate prevention, detection, investigation and sanctioning of fraud.

## **Comment**

Only for MAS/CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation.

ETH doctoral students working on topics related to poverty reduction in low- and middle income countries may also be admitted.

Registration only through the NADEL administration office.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=164090&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 868-0003-00L Module 3: Mediation Content

**Semester:** 2022S

**Relevant SDGs:** SDG16

**ECTS:** 10

**Lecturer:** Cederman, Lars-Erik; Wenger, Andreas

## **Abstract**

Students learn about the content of peace processes in this module. This module combines various

approaches to developing options with an examination of contemporary cases and how various content issues are managed and interlinked. The module focuses on security, power-sharing, justice, socioeconomic and environmental arrangements.

### **Objective**

Mediators learn about the content of peace negotiations and peace agreements in this module. The module builds on the understanding that the goal of mediation is not to eliminate the issues that are tearing a society apart, but rather to find mechanisms to deal with differences in a non-violent manner. Mediators need a sufficient understanding of various thematic topics related to peace processes (e.g., security, power-sharing, justice, economics) in order to create linkages between them and the specific content issues therein. An adequate level of knowledge of core themes will also help mediators understand how to work with expert advisors to support a mediation process. This module both introduces relevant theory on ways of dealing with content issues and looks at how such issues were managed and interlinked in specific contemporary cases. This module also begins to address the teamwork dimension of mediation, which will be further elaborated on in the following modules.

### **Comment**

Only for MAS Mediation in Peace Processes.

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159174&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 865-0000-11L Fragile Contexts – The Nexus between Humanitarian Aid, Peace and Development

**Semester:** 2022S

**Relevant SDGs:** SDG16

**ECTS:** 2

**Lecturer:** Brugger, Fritz; Mason, Simon Jonas Augusto

### **Abstract**

The course explores characteristics of fragility and how they are measured and monitored. It further discusses cooperation between actors (peace building, security, humanitarian, development cooperation) and explores how development programming has to be adapted to these situations.

### **Objective**

The course explores characteristics of fragility and how they are measured and monitored. It further discusses cooperation between actors (peace building, security, humanitarian, development cooperation) and explores how development programming has to be adapted to these situations.

### **Comment**

Only for MAS/CAS in Development and Cooperation students, as well as specialists with at least 24 months of practical experience in international cooperation.



ETH doctoral students working on topics related to poverty reduction in low- and middle income countries may also be admitted.

Registration only through the NADEL administration office.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lernereinheit.view?lernereinheitId=159819&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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## 868-0004-00L Module 4: Mediation Process Design

**Semester:** 2022W

**Relevant SDGs:** SDG16

**ECTS:** 10

**Lecturer:** Wenger, Andreas

**Abstract**

Mediators help the parties reach a peace agreement by designing and structuring the process. This module covers the basic elements of process design and how they differ. Important to process design is the reflection on theory and practice in sequencing the content to be examined. The module then explores the implications and challenges facing the implementation of peace agreements for mediators.

**Objective**

Mediators help the parties reach a peace agreement by designing and structuring the process. This module covers the basic elements of process design and how they differ. Important to process design is the reflection on theory and practice in sequencing the content to be examined. The module then explores the implications and challenges facing the implementation of peace agreements for mediators.

**Comment**

Only for MAS Mediation in Peace Processes.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lernereinheit.view?lernereinheitId=163165&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 865-0068-00L Justice and Normative Aspects of Development

**Semester:** 2022W

**Relevant SDGs:** SDG16, SDG10

**ECTS:** 2

**Lecturer:** Brugger, Fritz

## **Abstract**

This course discusses ethical questions of development relevant for international cooperation. Examples include: possibilities and limits of normative justification of development aid; theories of justice, human rights and the 'rights-based' approach to development, epistemological foundations of development theories, ethical questions of globalization.

## **Objective**

What is justice and why are human rights valid? What is development and what is the responsibility of the State? The answers always include normative judgements. Where these normative dimensions remain implicit, international development cooperation risks the unreflected export of its own value and belief systems. This course enables students to identify implicit normative dimensions, put them into the ethical context and to critically reflect on those normative aspects.

## **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163884&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# 865-0010-00L Politics and Governance

**Semester:** 2022W

**Relevant SDGs:** SDG16, SDG10

**ECTS:** 2

**Lecturer:** Brugger, Fritz

## **Abstract**

The course focuses on selected issues of governance systems in developing countries, and on possible interventions of development cooperation to improve the quality of governance.

## **Objective**

The course introduces students to the basics of governance systems in developing countries and to possible interventions of development cooperation to improve the quality of governance.

## **Comment**

Nur für MAS in Entwicklung und Zusammenarbeit.

**VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=163796&semkez=2022W&ansicht=KATALOGDATEN&lang=de>

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# SDG 17 – Partnerships for the Goals

## 851-0647-00L Model United Nations - International Policy-Making

**Semester:** 2022S

**Relevant SDGs:** SDG17

**ECTS:** 2

**Lecturer:** Egli, Florian Manuel; Hensgen, Leonie

### **Abstract**

This course takes the UN as a starting point to acquaint students with key competences decisive for effective international policy-making to address the most pressing issues of humanity. These include intercultural negotiation, mediation and complex problem solving skills. Participants receive the opportunity to exchange with UN staff, diplomats and civil society members engaged with the UN.

### **Objective**

Intercultural mediation, negotiation, complex problem solving, sustainable development goals and how those are addressed by the UN, team work

### **VVZ Link**

<http://sempro.ethz.ch/Vorlesungsverzeichnis/lerneinheit.view?lerneinheitId=159778&semkez=2022S&ansicht=KATALOGDATEN&lang=de>

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