



CAS ETH in Regenerative Materials

earth - bio-based - reused

Think Regenerative!

It is time to go beyond sustainability.

It is time to go beyond sustainability. Alternative solutions out of local resources such as earth, bio-based and reused materials are emerging all over the world and are triggering regenerative output, thanks to their capacity to contribute to the restoration and improvement of the surrounding natural and social environment. However, they are not widespread in the construction sector due to lack of information on the side of decision makers and lack of competence on the side of practitioners.

The Certificate of Advanced Study “Regenerative Materials – earth . bio-based . reused”, an international ETH training programme launched by the Chair of Sustainable Construction of the ETH Zurich, aims to tackle this problem. It offers knowledge and skills to question our conventional construction techniques and to promote regenerative materials from resource extraction to construction site, operation and end of life of the building materials. It promotes a territorial approach from the preliminary phase of the construction program.

Cover Picture: K118 Building by baubüro in situ, ZHAW exhibition. Photo Credit: Jusuf Supuk

Page 3: Corner Detail of Martin Rauchs House, Voralberg, Photo Credit: Janosch Kirchherr



Objectives

This continuing education program aims to give practitioners tools and methods to use earth, bio-based and reused materials with efficiency and creativity in order to contribute to the necessary ecological and social transition in the construction sector.

With this programme we ambition to:

- Train specialists to conduct complex projects using earth, bio-based and reused materials with realistic and affordable solutions,
- Highlight exemplary architectural projects developing circular economy and the use of «low carbon» materials,
- Offer a practical experience on real projects (new construction, thermal renovation, historic restoration),
- Create a network of professionals working on regenerative construction.

ETH Teaching Board :

Professor Dr Guillaume Habert
Dr Arnaud Evrard
Professor Dr Andrea Frangi
Dr Michael Klippel
Roger Boltshauser

International teaching board :

Dr Romain Anger, amàco (France)
Dr Laetitia Fontaine, amàco (France)
Dominique Gauzin-Müller, UNESCO (Germany)
Renaud Haerlingen, ROTOR (Belgium)
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Prof Dr Christof Ziegert, ZRS Berlin (Germany)
Ken de Cooman, BC Architects (Belgium)
Werner Schmidt, (Switzerland)
Dr Corentin Fivet, EPFL (Switzerland)
Prof Dr Francesco Pittau, PUM (Italy)
Dr Sophie Claude, INSA Toulouse (France)

Duration

Starting in January 2022
12 credits, 5 weeks distributed over 1 semester (theoretical and practical modules + individual project exercise)

Language of instruction

Courses are typically held in English. Visits and discussion with practitioners will be translated in English but given sometimes in French, German or Italian.

Infrastructure

Students are enrolled at ETH Zurich and are entitled to the use of all academic facilities, including student computer rooms, excellent libraries with electronic access to journals, discounted meals in student cafeterias, as well as access to sport and leisure facilities.



Hands-on during the module 2 of the CAS 2021
Photo Credit: Janosch Kirchherr

Target audience

16 participants from Switzerland and abroad.
Project managers, members of city technical services, building contractors, NGOs, architects, engineers.

Application

Applicants are asked to apply online and also include a motivation letter, a CV and two reference letters.

Application deadline: October 22nd, 2021.

The Ricola Foundation supported the creation of the CAS and is covering the admission fees of three participants with financial difficulties.

Tuition fees

CHF 7,000

It does not include living expenses.

For more information on the CAS

<https://sc.ibi.ethz.ch/en/education/cas-regenerative-materials.html>



Instagram:

@regenerative_materials_ethz

LinkedIn:

ETH - Chair of Sustainable Construction

Pedagogical Approach

The CAS programme explains how to achieve a project with non conventional materials in the Western world as well as in emerging and developing countries. It covers ecological aspects (environmental footprint, carbon storage), regulations (thermal, hygrothermal, fire resistance, seismic safety), evaluation of the costs, social aspects (communication, empowerment of the population, training of craftsmen).

The program uses new teaching practices with participative methods, experimental lectures, hands-on exercises, visits of inspiring projects and project-based learning:

Hands-on : These exercises are a great opportunity to put hands onto construction materials. Experimentations on mixes of natural fibres and earth allow a deep understanding of the main properties of these materials.

Visit : Once a week, a visit of exemplary buildings using regenerative materials is organised, valuing some vernacular and contemporary architecture in the surrounding of Zürich. Visits are conducted by stakeholders involved in their realisation.

Lecture : input lectures from well-known specialists are opened to a large audience for public awareness.

Project exercise : Group projects focus on realistic calls for tenders placing the students into a real-life professional situation. A special emphasis is placed on these exercises to develop skills and expertise of students.



Module 1 : Discovering Regenerative Materials

24.01-28.01.2022

- Discovery (composition, implementation, LCA analysis, aesthetic)
- Inspiration from vernacular and contemporary architecture: think local
- Adopt a territorial approach
- Social and ecological transition through Regenerative Materials
- Innovative project setting up to overcome legislative barriers

Module 2 : Earth construction

28.02-04.03.2022

- Construction techniques
- Focus on the structural behaviour and durability
- Cost and planning, existing standards
- Innovative processes: Prefabrication and production line

Module 3 : Bio-based construction

04.04-08.04.2022

- Construction techniques
- Focus on the thermal and hygrothermal behaviour
- Cost and planning, existing standards
- Recent development with lightweight materials

Module 4 : Re-valuing the building stock

16.05-20.05.2022

- Methodology for energy retrofit of existing buildings (historic to 80's)
- Refurbishment technique with Regenerative Materials
- Advantages of RM as finishing (air quality, acoustic, moisture regulation)
- Deconstruction: from dismantling to reuse
- Re-think modern building conception for future reuse

Module 5 : Individual project exercise

13.6-17.06.2022

- Analysis of the local resources, the regional know how and the social challenges of the project to tend towards a regenerative architecture
- Definition of a pre-programme with cost and planning
- Formulation of a strategy to overcome blockages

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