River Restoration
(as delivered in FS2024)

101-0259-00

Project-Based Education in Action

SELECTED TRANSFERABLE COMPETENCIES

FOSTERED:

- Analytical Competencies
- Project Management
- Creative Thinking

ASSESSED:

- Cooperation and Teamwork
- Communication

Lecturer responsible for the class:
Dr. Volker Weitbrecht

General team size:
2-3 lecturers, 2-4 coordinators and teaching assistants

Teaching team FS2024:
Simone Knecht, Jantina van der Meer, Dr. Matthias Mende, Dr. Christine Weber, Katharina Sperger, Sanjaya Dhonju Shrestha, Dr. Carlos Wyss

Department:
D-BAUG; Laboratory of Hydraulics, Hydrology and Glaciology (VAW)

Credits:
3 ECTS

Class size and study programme:
Max. 40 students, primarily Environmental Engineering MSc but also open to other study programmes

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Real-world or Practice Context

Driving question:
How can we revitalise a river section and restore near natural processes to increase habitat quality and biodiversity?

River restoration aims to reestablish near natural processes in riverscapes to increase habitat quality and biodiversity. Based on enhanced understanding of river morphodynamics, the course introduces different engineering techniques with focus on sediment transport processes and flood protection. In addition, the course aims to cope with the different expectations (space for agriculture, water for energy production, flood protection, nature protection...) towards riverscapes in modern society.

Practice context:
In 2023 and 2024 the case study area is a 1.7km stretch of the Töss River, Canton Zürich.

Learning Objectives

During this course, the students learn how to:

- Describe the most important relations in river morphodynamics and their impact on the ecosystem of riverscapes.

- Elaborate solutions within river restoration, dealing with the different societal expectations towards riverscapes.

- Deal with personal, social and technical obstacles in the planning of a river restoration project.

PBLabs

Process and Student Agency

Length/format of module:

- Intro week
- A role play exercise
- Self-guided fieldtrip to the study site
- Coaching sessions with lecturers (3 in total)
- Expert inputs from lecturers, to ensure students gain content across all the topic areas (even the ones they do not choose to work on for the project)
- Field trip to a completed restoration project
- Presentation session in a market-place format

Student agency in the project:

- Students can select from several focus topics they would like to work on.
- The project work is very self-guided: students have to discuss and agree which possible topics to work on, which questions to answer and what the report will contain. They are supported by a grading rubric and coaching to ensure that their decisions will meet the expectations of the lecturers (e.g. to avoid missing out a vital section due to lack of knowledge).

RIVER RESTORATION
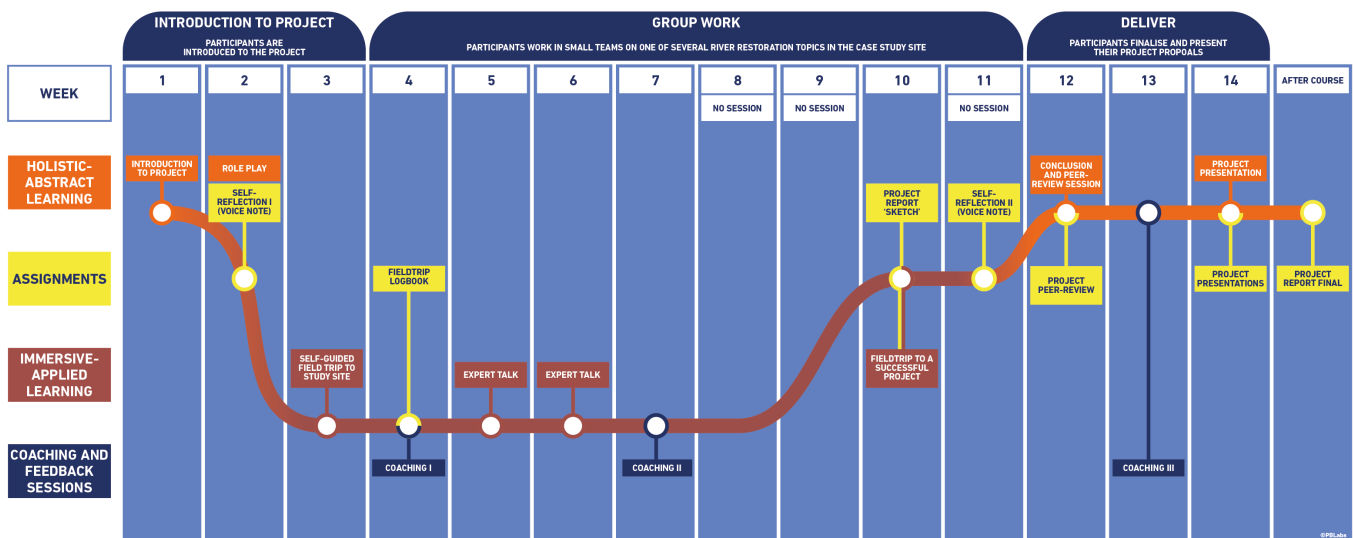
Guidance and Coaching

- Coaching sessions from lecturers for each of the focus topics.
- Optional coaching and feedback sessions from Teaching Assistants are regularly offered during the semester during regular office hour slots.
- Optional expert opinions from lecturers can also be requested.

Review and Assessment

- Project report (50%)
- Project presentation in the form of an elaborated situation map (not Powerpoint) (25%)
- Peer review of another group's report (25%)
- Bonus grade for active participation (+0.25 on final grade)

Reflection and Evaluation

- Self-reflections on the role-play exercise and field trips in the form of a voice note
- Feedback on the class is solicited via a Padlet

Anything else that makes this project special?

During the self-guided fieldtrip, OMLETH, a map-based web application that allows learning content to be experienced situationally and directly on site, is used. The students use the OMLETH Player to access learning content such as information or tasks via a geolocation push service. Learners' movements are precisely tracked and visualized in the OMLETH Viewer, which is very useful for debriefing the field trips. This data also helps to identify and discuss specific questions or topics. For more information, see https://omleth.ch/

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