

## Group Project (ENV-526)



Aerial view of the EPFL campus in Lausanne © Jamani Caillet

### Project Task

Work in groups of 5-6 students (groups should include both IE and IA students). Produce a detailed plan to improve climate and water management on the EPFL campus using nature-based solutions. The deliverables should include (1) a portfolio and (2) a technical report.

The portfolio should consist of max 10 pages/slides and include the following:

- Narrative & goals
  - To define the narrative, each group can elaborate on a concept of their choice or choose one of the following **themes**: (i) leaf venation, (ii) river branching, (iii) veins and arteries, (iv) honey comb. Support your narrative with references to history/theories of architecture, scientific articles, etc.
  - Goals should include temperature and runoff targets
- Site description (status quo) and characterization (e.g., historical development, land use, pedology, climate)
- Description of the proposed Nature Based Solutions (NBS), the design iterations, and the final plan. Note that:
  - the project should include (i) street trees/canopies, (ii) green roof, (iii) pervious pavement, (iv) swale, (v) pond and/or infiltration/detention system;
  - each group member should design one of the aforementioned NBS but the different parts should be connected within a single plan/green infrastructure.
- An assessment of runoff generation for: (i) greenfield condition, (ii) existing situation, and (iii) after the proposed interventions. Clearly show differences among scenarios. This could be done using the [InVEST](#) model but other models/methods can also be used under approval of the course coordinator
- An assessment of the air temperature and/or thermal comfort for: (i) greenfield condition, (ii) existing situation, and (iii) after the proposed interventions. Clearly show differences among scenarios. This should be done using the [SOLWEIG](#) (recommended) or [TARGET](#) model but other models/methods can also be used under approval of the course coordinator.
- Conclusions (e.g., overall impact of proposed NBS, benefits/costs, alternatives). Clearly show a quantification of the achieved benefits (i.e., temperature and runoff differences before/after interventions) and compare them with your initial goals.

The technical report should be divided into two parts:

- **Part A** should include a description of the data and models used (assumptions, equations, etc) and any supplementary data, table, analysis, etc. supporting the results illustrated in the portfolio;
- **Part B** should focus on the detailed design of the different NBS proposed for the campus - **one section/NBS per group member (for individual assessment)**. Each section should focus on a specific NBS (i.e., green roof, pervious pavement, swale, pond, infiltration/detention system) and include the following:
  - a short literature review on the selected NBS (minimum 5 reference from scientific/technical studies and/or architecture journals/magazines);
  - a description of the proposed solution (preliminary sketches, technical drawings, cross-sections, etc);
  - a detailed design of the proposed intervention (with calculations). **The design of each NBS should follow the method/criteria described in the lecture notes and the CIRIA Manual (available in Moodle).**
  - a comparison of the results with the InVEST simulations from Part A

**Note:** both portfolio and technical report should include high-quality illustrations and technical drawings (with scale/dimensions, legend, design details, etc).

## Assessment

Coursework constitutes **60%** of the final mark: 40% for the group project (portfolio + technical report Part A) and 20% for the individual component (technical report Part B). Submissions will be marked according to the following requirements:

- Quality of the document in terms of its appearance and appropriate use of text, images and diagrams;
- Originality and appropriateness of the proposed design solutions;
- Rigorous approach to evaluation of an engineering project;
- Choice and justification of evaluation criteria;
- Ability to summarise technical information for a general audience;
- Ability to search for and reference material correctly.

Your work will be marked by the course coordinator and the assistants.

## Case study

The case study is the EPFL/UNIL campus. Basic data and maps will be made available in Moodle. Different case studies can be chosen upon approval of the model coordinator.

## Submission

- Submit 1 portfolio and 1 report per group via Moodle **before 4pm on May 30**;
- Submit two files only (PDF format), include the full names of all team members in each file, and clearly state the contribution of each group member in the technical report (Part B).
- 5% will be deducted from teams marks if the team does not present its work in progress during the Projects Review on **Week 11**;
- If you submit your coursework late, you must e-mail it directly to Prof. Gabriele Manoli ([gabriele.manoli@epfl.ch](mailto:gabriele.manoli@epfl.ch)). A 5% (per day) penalty will be applied to late submissions.

## Plagiarism

All work that is not your own **MUST** be referenced according to [EPFL guidance](#) on plagiarism. This includes websites, online journals, images from other sources, and the work of your classmates.

The **use of AI** tools (e.g., chatGPT) **MUST** be acknowledged too (explaining how AI is used).

## Useful links & examples

- Urban InVEST model:
  - [Urban InVEST | The Natural Capital Project](#)
- SOLWEIG model:
  - [Thermal Comfort - Introduction to SOLWEIG — UMEP Tutorial documentation](#)
- TARGET model:
  - [TARGET \(mothlight.github.io\)](#)
- Rainfall (extreme value analysis) in Switzerland:
  - <https://www.meteoswiss.admin.ch/climate/the-climate-of-switzerland/records-and-extremes/extreme-value-analyses.html>
- How to create a portfolio:
  - [How To Create A Landscape Architecture Portfolio - YouTube](#)
  - [Landscape Architecture Portfolio Guide](#)
  - Examples:
    - [Portfolio: Marcel Troeger « Landezine International Landscape Award LILA](#)
    - [Landscape Architecture Portfolio by Qingyang Liu](#)
    - [Landscape Architecture Portfolio](#)
    - [vania-coelho-santos-portfolio-spring-12.pdf](#)