

Swiss Federal Institute of Technology Lausanne, EPFL
School of Architecture, Civil and Environmental Engineering, ENAC
Civil Engineering Section
Concrete Behaviour and Structural Design Laboratory, CONSTRUCT
January 2023

Semester projects

Conception and Design of Reinforced Concrete Structures

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1 Bachelor level

1.1 Design of a Regular Reinforced Concrete Building

- **Project category:**
GC
- **Project type:**
Bachelor project
- **Project supervisors:**
Prof. David Ruggiero (validate the project), Dr. Filip Niketic and Elias Merhi



- **Description:**
Today, despite its significant environmental impact, reinforced concrete still composes the vast majority of buildings constructed in Switzerland and around the world. Civil engineers are expected to be capable of efficiently designing the different load-carrying elements composing concrete structures in order to deliver a sustainable design and optimize their service lives.
In this project, plan and elevation views of a reinforced concrete building are provided. In groups of two, you are expected to design a load transfer mechanism that consists of common reinforced concrete elements and that is efficient at transferring the loads from the superstructure to the foundation system.
 - **Keywords:**
Load Transfer Mechanisms, Concrete Structures, Modeling, Conception and Design.
- To register for the project please send an email with your names to: elias.merhi@epfl.ch**

2 Master level

2.1 Design of an Irregular Reinforced Concrete Building

- **Project category:**
GC
- **Project type:**
Construction Project, Civil System Project
- **Project supervisors:**
Prof. David Ruggiero (validate the project), Dr. Filip Niketic and Elias Merhi



- **Description:**
As a result of advancements in numerical computation, civil engineers are gaining access to tools that allow them to design any complex structure efficiently. In today's society, simplicity and regular shapes are no longer the rule when it comes to the conception of any newly constructed structure. Architects can now create buildings that can have any configuration and that are expected to be adequately designed by Civil Engineers.

In this project, plan and elevation views of a reinforced concrete building are provided. In groups of two students, you are expected to design a load transfer mechanism that consists of common reinforced concrete elements and that is efficient at transferring the loads from the superstructure to the foundation system. Two variants of the same building must be studied and compared: one with a regular shape and the other with a more complex geometry.
- **Keywords:**
Load Transfer Mechanisms, Concrete Structures, Modeling, Conception and Design.

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