

CIVIL-414

Advanced design of concrete structures

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Cursus	Sem.	Type
Civil Engineering	MA2, MA4	Opt.

Language of teaching	English
Credits	3
Session	Summer
Semester	Spring
Exam	During the semester
Workload	90h
Weeks	14
Hours	3 weekly
Courses	2 weekly
Exercises	1 weekly
Number of positions	

Summary

The first part of the course deals with the design of precast reinforced concrete structures. In the second part, some particular topics which are relevant for buildings (design of columns, detailing of reinforcement) and some advanced design methods for linear and planar members are presented.

Content

- Precast structures
 - General introduction for prefabrication in buildings
 - General introduction for prefabrication in bridges
 - Precast floors.
 - Precast connections
 - Precast production facilities
 - Imperfections in precast concrete
- Design of columns in buildings
- Anchorages and reinforcement's detailing
- General design of linear members, Interaction shear-torsion V_y - V_z - M_y - M_z - T
- General design of planar members, interaction bending moments - membrane forces

Keywords

Structural concrete, precast structures, reinforcement's detailing, design, dimensioning methods

Learning Prerequisites**Required courses**

CIVIL-234 « Structures en béton » (BA5) or similar

Recommended courses

CIVIL-525 « Structures en béton, chapitres choisis »
CIVIL-430 « Ponts en béton »

Important concepts to start the course

Design and dimensioning of reinforced concrete structures

Learning Outcomes

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

- Design precast structures
- Dimension precast structures
- Dimension columns, linear elements and planar members subjected to complex internal forces
- Design detailing the reinforcement for typical reinforced concrete members

Teaching methods

ex cathedra

Expected student activities

Assessment of small project (conceptual design of a precast structure, dimensioning of some members, detailing of relevant parts and connections),

Assessment methods

continuous assessment during semester

Supervision

Office hours	Yes
Assistants	Yes
Forum	No

Resources

Bibliography

fib Bulletin 74. Planning and design handbook on precast building structure

Ressources en bibliothèque

- [FIB bulletin 74](#)