Prefabricated Concrete Constructions (E052630)

Valid as from the academic year 2019-2020

Course Specifications

Lecturers in academic year 2019-2020
Matthys, Stijn TW14 lecturer-in-charge
Moerman, Wim TW14 co-lecturer

Course offerings and teaching methods in academic year 2019-2020
A (semester 1) English
- Project 11.25 h
- Lecture 13.75 h
- Excursion 5.0 h
B (semester 1) Dutch
- Excursion 5.0 h
- Project 11.25 h
- Guided self-study 13.75 h

Offered in the following programmes in 2019-2020
- Bridging Programme Master of Science in Civil Engineering 3 B
- Master of Science in Engineering: Architecture (main subject Architectural Design and Construction Techniques) 3 A
- Master of Science in Engineering: Architecture (main subject Urban Design and Architecture) 3 A
- Master of Science in Civil Engineering 3 B
- Master of Science in Civil Engineering 3 A
- Exchange Programme Architecture 3 A

Teaching languages
Dutch, English

Keywords
Structural engineering, prefabrication, prefab systems and products, design, reinforced concrete, prestressed concrete, connections, stability, transport and construction, construction site visit

Position of the course
Imparting insights into the nature, function and structural behaviour of prefabricated structures. Presenting methods and performance criteria for the design and construction of prefabricated structural elements, buildings and civil structures. This course extends the knowledge on design and construction, for the specific case of prefabricated structures. The latter represent at least 1/3th of the construction market.

Contents
- Principles and concept of prefabrication
- Prefabricated products
- Design recommendations and constructive aspects for building systems and basic elements
- Stability: frame structures, skeletal structures, load-bearing wall structures
- Specific structural aspects: connections, structural integrity, handling and fire safety
- Architectural concrete and facade systems, innovations in prefabrication, finishing and detailing, safety on site

Initial competences
At least, you followed the course Concrete Technology (participated in the teaching and examination activities).
Final competences

1 Knowledge
   Mastering the concepts and insights regarding the function, structural aspects and the structural behaviour of building systems and basic elements in precast concrete. Be able to perform a design in precast concrete.

2 Skills
   Being able to apply the aforementioned structural elements and methodology in the design of buildings and civil structures, with respect to calculation methods, design criteria and construction.

3 Attitudes
   Sound design and application of precast concrete in construction. Identify the importance of bearing structure and structural aspects in the architectural design.

Conditions for credit contract
   Access to this course unit via a credit contract is determined after successful competences assessment.

Conditions for exam contract
   This course unit cannot be taken via an exam contract.

Teaching methods
   Guided self-study, excursion, lecture, project.

Extra information on the teaching methods
   Weekly classroom lectures (lecture presentations, video material, 3D virtual models), further supplemented with project work (including new developments in the field from scientific publications).

   In addition there is a visit to both a prefabricated concrete construction site and a precast concrete factory.

Learning materials and price
   Syllabus. Additional information on the digital learning platform.

References
   - Planning and design handbook on precast building structures, FIP (Fédération Internationale de la Précontrainte)

Course content-related study coaching
   Syllabus. Additional information on the electronic learning platform.

Evaluation methods
   end-of-term evaluation and continuous assessment.

Examination methods in case of periodic evaluation during the first examination period
   Open book examination, oral examination.

Examination methods in case of periodic evaluation during the second examination period
   Open book examination, oral examination.

Examination methods in case of permanent evaluation
   Report.

Possibilities of retake in case of permanent evaluation
   Examination during the second examination period is possible.

Extra information on the examination methods
   The knowledge of the course material is verified by means of an open-book exam. Hereby, also use is made of a 3D virtual building model to explain and/or indicate specific prefabrication aspects.

   In addition, the project work is evaluated by means of the submitted report.

Calculation of the examination mark
   50% on the open-book exam.
   50% on the project work.