

Course Specifications

From the academic year 2018-2019 up to and including the

Basics of Structural Engineering (E051510)

Course size (nominal values; actual values may depend on programme)

Credits 9.0 Study time 270 h Contact hrs 75.0 h

Course offerings and teaching methods in academic year 2018-2019

A (semester 1)	English	seminar: coached	20.0 h
		exercises	
		lecture	20.0 h
		project	10.0 h

Lecturers in academic year 2018-2019

Van Coile, Ruben	TW14	lecturer-in-charge
Snoeck, Didier	TW14	co-lecturer

Offered in the following programmes in 2018-2019

	crdts	offering
Bridging Programme Master of Science in Fire Safety Engineering	9	A
International Master of Science in Fire Safety Engineering	9	A
Master of Science in Fire Safety Engineering	9	A

Teaching languages

English

Keywords

- Structural analysis
- Structural equilibrium
- Material behaviour
- Load conditions
- Statically determinate structure
- Statically indeterminate structure
- Deformation
- Restrained deformation

Position of the course

In this course students learn the essential principle of structural analysis at normal design temperatures, both for statically determinate and statically indeterminate structures. In this regards, the course links to the core competencies of the degree as defined as part of the learning competencies.

Contents

- Revision of mechanical material behaviour
- Equilibrium of structural systems (statically determinate and statically indeterminate)
- Load conditions and internal load transfer
- Deformation of structures, as calculated using integration methods, and using virtual work
- Restrained deformation and its influence on force distributions
- Thermal effects in normal design conditions (uniform temperature changes and linear temperature gradients in thermal equilibrium across the structural element).
- Introduction to safety factors and design combinations for structural design
- Introduction to common building materials

Initial competences

Basic concepts of mechanics of materials

Final competences

- 1 Determining the equilibrium and deformation of statically determinate structural systems

- 2 Determining the equilibrium and deformation of statically indeterminate structural systems
- 3 Insight in the effect of boundary conditions on the deformation and load distribution in the structure
- 4 Perform a load transfer
- 5 Appraising the deformation and load distribution in the structure in case of small uniform temperature changes and linear temperature gradients across structural elements.
- 6 Performing a critical analysis of the quality and correctness of a structural analysis
- 7 Insight in the effect of material choice on structural behaviour and deformations
- 8 Ability to assess the cause of structural failure in joint cooperation with peers
- 9 Explain the use of safety factors and load combinations in design practice

Conditions for credit contract

This course unit cannot be taken via a credit contract

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Group work, lecture, project, self-reliant study activities, seminar: coached exercises

Learning materials and price

Recommended reference work
 Hibbeler, R.C. (2016). Mechanics of Materials (10th Edition).
 (30 euro, 2nd hand online store)

References

Course content-related study coaching

The lecturers and assistants can be contacted before or after the lectures or exercise sessions, through e-mail or after making an appointment

Evaluation methods

end-of-term evaluation and continuous assessment

Examination methods in case of periodic evaluation during the first examination period

Written examination

Examination methods in case of periodic evaluation during the second examination period

Written examination

Examination methods in case of permanent evaluation

Written examination, assignment, report

Possibilities of retake in case of permanent evaluation

examination during the second examination period is possible in modified form

Calculation of the examination mark

Periodic evaluation: 4/9
 Continuous evaluation: 5/9

When less than 9/20 is obtained for either one of the parts, passing the full course is no longer possible. If the final score would in this case exceed 10/20, the score will be reduced to 9/20.