Structural Engineering and Design: Structural Engineering Essentials elective package

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Structural Engineering and Design: Structural Engineering Essentials (This flyer will be updated soon)			
Offered by	Department of Faculty of the build environment		
Language	English		
Primarily interesting for	All students		
Prerequisites	Required courses: 7P3X0 (Statics of structures, Bachelor College Year 1 Quartile 3) 7PPX0 (Dimensioning of structures, Bachelor College Year 2 Quartile 2) 7P3X0 (Statics of structures, Bachelor College Year 1 Quartile 3) 7PPX0 (Dimensioning of structures, Bachelor College Year 2 Quartile 2) Recommended courses: -		
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Content and composition

The unit Structural Design delivers two coherent course packages: Structural Engineering Essentials (two courses) and Structural Engineering Advanced (three courses).

The combination of both coherent course packages forms an essential preparation when focusing on the unit Structural Design (SD) within the Graduate School. Later on, when following your graduate school program within the section SD, the courses and end project will lead to a proper preparation for a future function as Structural Engineer, Structural Designer or Structural Researcher.

Further, the separate coherent package Structural Engineering Essentials forms basic knowledge for students with a focus on Architectural and Urban Design and Engineering (AUDE) and special interest in technical aspects of architectural design.

At the end of the bachelor program the unit SD offers two different types of bachelor end projects:

1) Structural design of a medium Examples of 1)

sized building

2) Parametric and generative design



Examples of 2)



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Course code	Course name	Level classification
7P7X0	Timber structures and experimental research	-
7P8XO	Concrete and masonry structures	-

Course description

Timber structures and experimental research (7P7X0)

As a structural material timber has a special positive assessment with regard to its radiant appearance and sustainability aspects (CO2, LCA). Good practice and responsible application, structural design and avoiding design errors are part of this course. This course also teaches how, in general, material properties are experimentally determined, what is needed for, and how the results can be used in construction calculations.

Important learning objectives of the course are:

- 1) Be aware of the material properties of wood which are required to identify good or bad design and detailing of timber structures as special attention is necessary to ensure the safety and durability.
- 2) Be familiar with various methods of experimental research for materials and components in construction.
- 3) Be familiar with the possibilities and limitations of studies and methodologies.



Concrete and masonry structures (7P8X0)

The course Design of Structures is about linking mechanical analyses to in depth understanding of structural concepts. To become more experienced in understanding structures (and more particularly statically indeterminate structures) half of this course focusses on mechanical schemes and calculation methods. The other half focusses on gaining a better understanding of structures. Here, students are asked to translate a structural concept into an explanatory physical models (that has to be build and demonstrated to all other students). Afterwards, all models will be exposed in an exhibition. In this way, other students learn from the models as well. Each physical model explains a specific structural concept by linking this to an example in every day usage (a non-building item) as well as to a structural application in a building. A constructive concept for example, is a leverage, which can be made visible in a model in many ways. Mechanical formulas can be used for the specific model to explain balancing forces. To show this principle in the real world, a student can choose from many examples, such as a pair of scissors, pliers, nuts cracker, et cetera. And to further explain the principle in an application in a building, a picture of a construction crane, drawbridge or the pagoda in the Efteling can be used.

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