Building and Environment

Offered by: Built Environment
Language: English
Primarily interesting for: This package is recommended for students from Bachelor major Architecture, Urbanism and Building Sciences
Prerequisites: The following prerequisites are recommended:
   3NAB0 Applied Physical Sciences conceptual
   7S3X0 Introduction Building Physics and Material Science
   7S4X0 Building Physics and Building Services engineering

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Content and composition

The coherent package of Building Physics 2 is a preparation for the more technical master tracks. The package deals with the relationship between the building and its surroundings. In the package, the emphasis is on the performance of the building within its environment, which is evaluated by means of simulation and modeling.

Within the specialization you will deal with the physical building aspects at both levels of detail and the scale area of the city regarding wind, noise, sunlight and precipitation.

With Computational Fluid Dynamics (CFD) calculated (dimensionless) wind field around the buildings on the campus of TUE (W. Janssen, 2012)
There are no specific requirements regarding the order of the courses. The courses are programmed in the Bachelor in this sequence.

### Course descriptions

#### Building Performance Evaluation
In this course students will work with the principle of discovery and problem based learning. For the content part this will be in the form of concept mapping, where students will work in pairs and describe and discuss important concepts and questions that are part of the course. This is called Track A. For Track B and C students will work individually on assignments. Every week maximum 4 hours will be reserved to provide an introductory lecture (2 hours) and for support on the concepts and the assignments and to discuss or answer questions. The remainder of the time for the course is available for the students to work on the concept maps and assignments.

#### Urban Physics: wind, acoustics, insolation and precipitation
The increasing urbanization, traffic and the increasing requirements of health and comfort in the context of complex energetic, ecologic and economic boundary conditions, put ever higher demands on the quality of the climate. Urban physics deals with the interaction of the outdoor climate with cities and the people living and working in these cities, and with problems as wind, heat stress, air pollution and noise, often caused by the way in which buildings and cities are designed and operated.

#### Materialization of facades and roofs
The quality and identity of facades and roofs are largely determined by the materials and products used. This course covers the key architectural principles, which fit into the chosen materiality of the facade while maintaining the necessary materials science-building physical condition, and discusses responsible choices for materials and products. The course also shows lessons from the past to secure the future quality.