

Building Physics: Building Climate and Systems

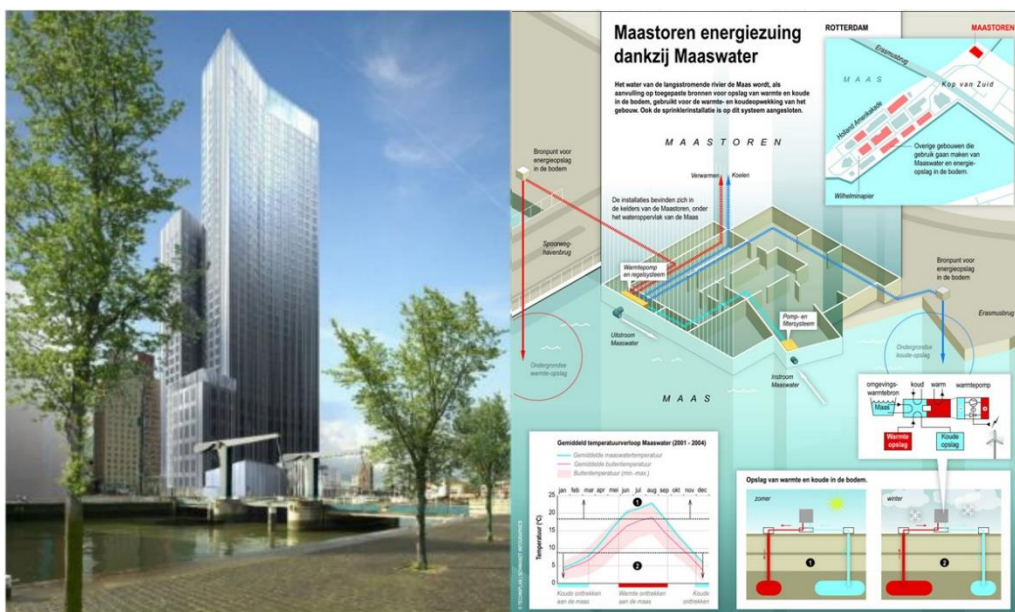
Building Physics: Building Climate and Systems (This flyer will be updated soon)

Offered by	Department of the Built Environment
Language	English
Primarily interesting for	All students, but most relevant for students with background in Bachelor major Architecture, Urbanism and Building Sciences
Prerequisites	Required courses: - Recommended courses: 3NAB0 Applied Physical Sciences conceptual 7S3X0 Introduction Building Physics and Material Science 7S4X0 Building Physics and Building Services engineering
Contact person	Dr. K. Schollbach (k.schollbach@tue.nl)

Content and composition

The coherent package Building Physics 1 is a preparation for the master track Building Physics and Services. The package covers the connection between people, building and HVAC systems and the integration of the systems in the building. In the package, the emphasis is on the performance of buildings and systems, which is evaluated by simulation and modeling.

In the package the Differential Equations and Matrices course is included, because the simulation programs use these techniques and understanding of them is required, also for the master track Building Physics and Services. Within the specialization you will engage yourself with the relationship between the various building physics items such as heat, light, sound and moisture and technical systems.



Application of surface water with heat pump heat/cold storage:

System analysis, measurement and simulation Maastoren Rotterdam (Rik Molenaar 2011)

Building Physics: Building Climate and Systems

Course code	Course name	Level classification
2DBA0	Differential Equations and Matrices	-
7S8X0	Building Services	-
7S9X0	Introduction Building Performance	-

Course description

Differential Equations and Matrices (2DBA0)

Differential Equations and Matrices is a mathematics course that provides the necessary mathematical knowledge for the courses in the Master Building Physics and Services. The course has the following contents:

- Complex numbers
- Differential equations
- Linear algebra
- Solving Equations
- Eigenvalues, eigenvectors
- Linear systems of differential equations

Building Services (7S8X0)

Integral design process, integrated design of building and building services, overview of building services installations, insight in performances of these systems within different applications, system selection. The lectures focus on the design, dimensioning of building systems for climate control and building safety. An introduction to the control theory for building systems is treated and exercised. The systems for heating, ventilation and cooling are covered, including the design of the required control circuits. The designs are tested by means of compact design assignments. Some state of the art concepts for sustainable buildings are explained and their use and limitations are discussed. For the aspect of active building safety sprinklers are treated

Introduction Building Performance (7S9X0)

This course introduces students to building performance assessment (with a focus on energy and indoor environmental quality) during the (pre)design and operational phase of buildings. The course provides students with the conceptual knowledge to assess the performance of buildings in the (pre)design and operational phase using a variety of tools (e.g. sensors, data loggers and building performance simulation tools) and methods (e.g. measurement and simulation).

Learning objectives:

1. Students will be able to apply the performance based approach to improve building performance and they will be able to value the concepts, assumptions and limitations that are related to the methods currently used in the performance based approach.
2. Students will be able to utilize a state-of-the-art building performance simulation tool on a basic level to analyze the performance of a building design and to suggest design improvements.
3. Students will be able to analyze building measurement data in order to assess building performance.