

An aerial night photograph of the TU/e campus in Eindhoven, showing several modern buildings with illuminated windows. The image is overlaid with a semi-transparent red filter. The text is positioned on the left side of the image.

Mastertrack Presentation

Building Physics and Services (BPS)

Dr. Katrin Schollbach, k.schollbach@tue.nl

The Department of the Built Environment

Bachelor College

Graduate School

PhD
Doctor of
Philosophy

PDEng
Professional
Doctorate in
Engineering

MSc
Master of
Science

BSc
Bachelor of
Science

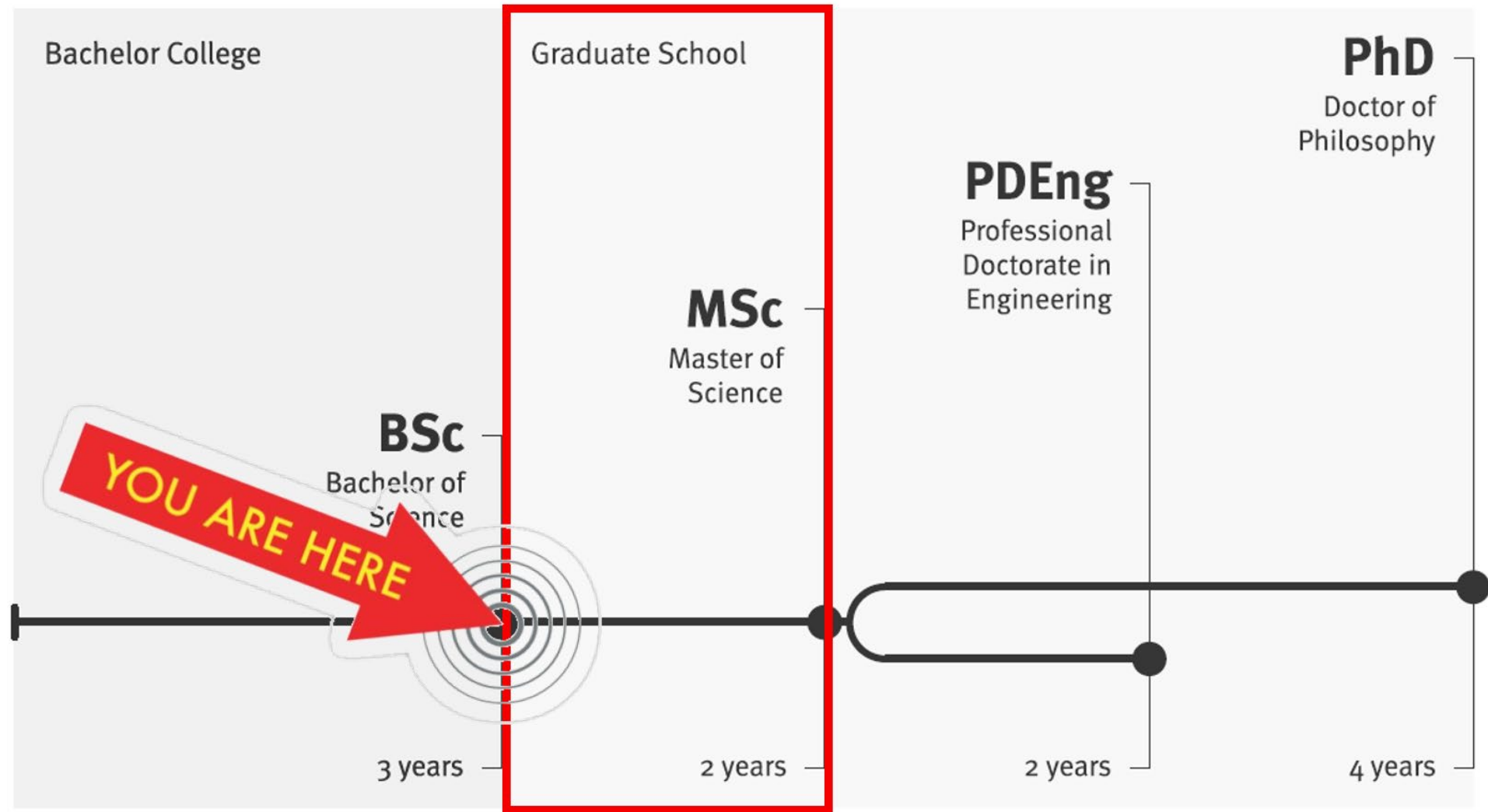
YOU ARE HERE

3 years

2 years

2 years

4 years



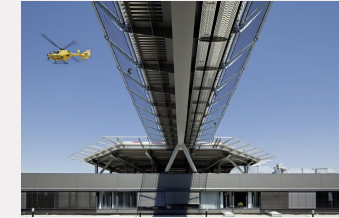
Graduate Programs BE

CME

ABP – main master tracks:

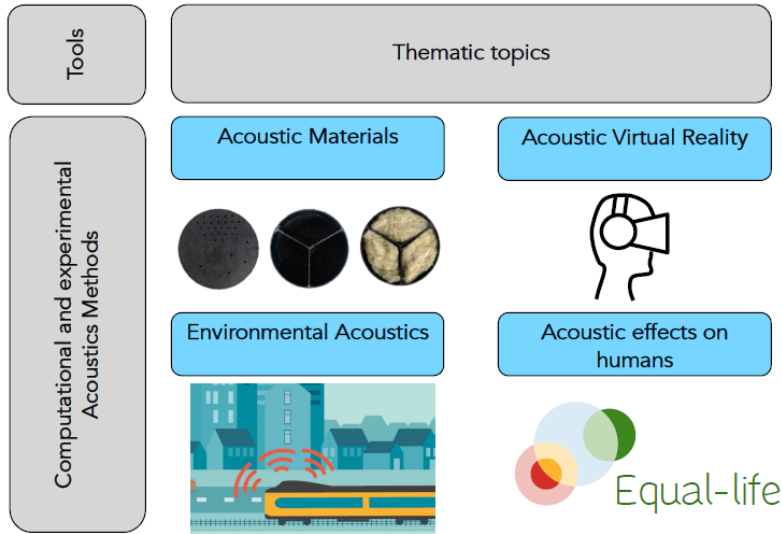
- Architectural Urban Design and Engineering AUDE
- Urban Systems and Real Estate USRE
- Building Physics and Services BPS
- Structural Engineering and Design SED
- Sustainable Urban Mobility Transition SUMT *
- Smart Mobility Data Science and Analytics SMDA *

* special admission requirements + 2 universities involved



Building Physics and Services

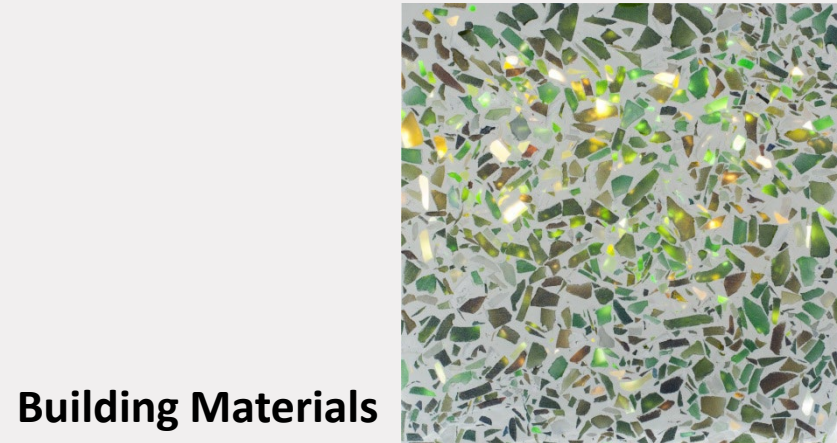
Research line

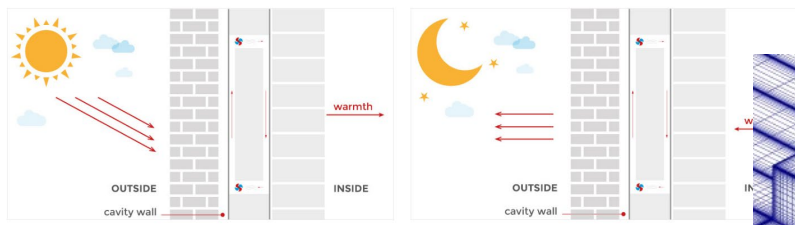


Building Acoustics

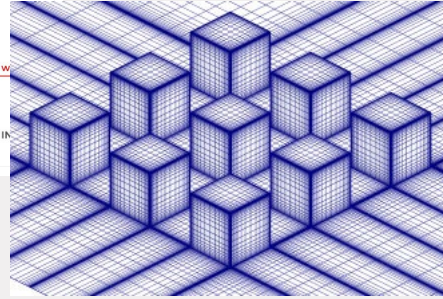


Building Lighting

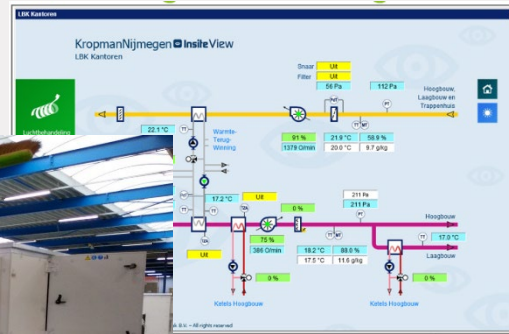




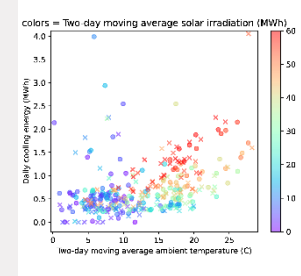
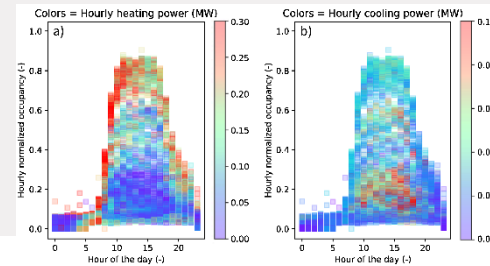
Building Physics



Building Performance



Building Service



Perception air quality

- There is some stale air in here (reversed)
- There is a lot of fresh air in here
- The air is dusty in here (reversed)
- The classroom is properly ventilated
- There is a bad smell in here (reversed)
- The air is dry in here (reversed)

ABP track BPS

Core courses

			Quarter	ECTS
Core courses	7S880	Lighting technology	2	5
	7LS3M0	Sustainable building/ phys. aspects...	1	5
	7LS8M0	Architectural acoustics	3	5
	7LS9M0	Heat, air & moisture transfer/CFD 1	3	5
	7LY3M0	Building perf. and energy systems sim.	1	5
	7LY4M0	Building services and fire safety	4	5

30

Specialization electives

Specialization electives	<u>Choose 30 ects out of 55 ects</u>			
	7LS0M0	BPS Master project design	1-2/3-4	10
	7LS1M0	BPS Masterproject A, research	1-2/3-4	10
	7LS2M0	BPS Masterproject B, research	1-2/3-4	10
	7LL7M0	Capita selecta lighting technology	3	5
	7LS6M0	Heat, air & moisture transfer/CFD 2	4	5
	7LY5M0	Intelligent buildings	1	5
	7LY6M0	Materials panorama	2	5
	7LY7M0	Techniques in architectural acoustics	4	5

30

Electives¹ 15

7S45M0 Graduation Project BPS 1/2/3/4 45

Masterprojects

- 10 ECTS, duration 2 quartiles
- can be started Q1 or Q3

Masterproject research A + B

- join one of the research groups in BPS (Building Acoustics, Lighting, Materials, Performance, Physics or Services)
- be part of an existing research program or realize your own ideas
- can include performing experiments in a lab or onsite, carry out simulations, surveys
- small version of the graduation project

Masterprojects

- 10 ECTS, duration 2 quartiles
- can be started Q1 or Q3

Masterproject design

- alternative to Masterproject research
- can be group project
- focus on design, based on real-world challenges

ABP track BPS

			Quarter	ECTS
Core courses	7S880	Lighting technology	2	5
	7LS3M0	Sustainable building/ phys. aspects...	1	5
	7LS8M0	Architectural acoustics	3	5
	7LS9M0	Heat, air & moisture transfer/CFD 1	3	5
	7LY3M0	Building perf. and energy systems sim.	1	5
	7LY4M0	Building services and fire safety	4	5

30

Choose 30 ects out of 55 ects

Specialization electives	7LS0M0	BPS Master project design	1-2/3-4	10
	7LS1M0	BPS Masterproject A, research	1-2/3-4	10
	7LS2M0	BPS Masterproject B, research	1-2/3-4	10
	7LL7M0	Capita selecta lighting technology	3	5
	7LS6M0	Heat, air & moisture transfer/CFD 2	4	5
	7LY5M0	Intelligent buildings	1	5
	7LY6M0	Materials panorama	2	5
	7LY7M0	Techniques in architectural acoustics	4	5

30

Electives

Electives¹ 15

7S45M0 Graduation Project BPS 1/2/3/4 45

Free Electives

- any master course at the Built Environment or other departments at TU/e
- master courses at other Dutch or foreign universities (Exchange semester)
- Internship at Dutch or foreign companies (5 or 15 ECTS)
- for foreign students C1/C2 level Dutch course



Internships

- 5 or 15EC
- finding company is responsibility of the student
- start and end dates can be flexible

- Project description needs to be approved by mentor
- Evaluation in the end based on presentation and/or report

ABP track BPS

			Quarter	ECTS
Core courses	7S880	Lighting technology	2	5
	7LS3M0	Sustainable building/ phys. aspects...	1	5
	7LS8M0	Architectural acoustics	3	5
	7LS9M0	Heat, air & moisture transfer/CFD 1	3	5
	7LY3M0	Building perf. and energy systems sim.	1	5
	7LY4M0	Building services and fire safety	4	5

30

Choose 30 ects out of 55 ects

Specialization electives	7LS0M0	BPS Master project design	1-2/3-4	10
	7LS1M0	BPS Masterproject A, research	1-2/3-4	10
	7LS2M0	BPS Masterproject B, research	1-2/3-4	10
	7LL7M0	Capita selecta lighting technology	3	5
	7LS6M0	Heat, air & moisture transfer/CFD 2	4	5
	7LY5M0	Intelligent buildings	1	5
	7LY6M0	Materials panorama	2	5
	7LY7M0	Techniques in architectural acoustics	4	5

30

Electives¹ 15

7S45M0 Graduation Project BPS 1/2/3/4 45

Graduation Project

Graduation Project

- choose the main subject based on your interests in one (or two) of the six main areas of BPS
- Graduation projects in cooperation with companies or company or government organizations are possible
- results are a written thesis and a defense/final colloquium
- 45EC over 3 quartiles

Graduation Project

Requirements

- No more than 20 EC left open
- Approval of personal study plan and signed declaration of scientific conduct

Examples

- Optimal lighting conditions for a Post Anaesthesia Care Unit: Assessing the current lighting conditions and when needed, provide recommendations on how to improve them during night.
- Airborne transmission of diseases in care facilities: Investigation of different possible improvements to the current building and ventilation design of long-term care facilities to counteract the spread of infectious diseases
- Data mining and machine learning techniques for extracting hidden information from building energy consumption data to improve the energy efficiency of Heating, Ventilation and Air-conditioning systems.

Examples

- Air purification in parking garages: Simulations of the airflow and particulate matter (PM) distribution in parking garages aiming to determine the potential of filter placement.
- Road traffic noise interventions: Effectivity of noise interventions in terms of health and wellbeing addressing the effects of a road surface and barrier interventions. Can method be developed to quantify the effects on a low-level scale?
- Design of an innovative bio-concrete. Use of Miscanthus/Elephant grass fibers as a lightweight aggregate in cement to design a natural fiber-based concrete.

Student Day

Career outlook

- > Consultant (Consultancy firm in Building Industry)
- > Researcher, academic (University, TNO)
- > Manager (Building company, consultancy firm, ...)
- > Policy maker (Governmental bodies)
- > R&D (Building materials company, building software)



ABP Double Tracks

Double track combinations

- Architecture –Structural Engineering and Design
- Architecture –Building Physics and Services
- Architecture –Urban Systems and Real Estate

Characteristics

- 150/160 credits
- Requirements have to be met
- Both tracks are stated on the diploma
- Switch can be made in the first 3 months of master

<https://studiegids.tue.nl/opleidingen/graduate-school/masters-programs/architecture-building-and-planning/curriculum/double-tracks/>



Certificate Programs

Building Design and Technology

- + Building Methodology and Technology
- + Building Technology with extreme complexity
- + Masterproject Building Technology

Construction Technology

- + Procurement
- + Parametric Design
- + Masterproject Construction Plan

Circular Design

- + Circular Design in the Built Environment
- + Circular Research and Design Project

Questions?

Mentor BPS students
Katrin Schollbach
k.Schollbach@tue.nl
Vertigo 6.13

