AF2513 Smart buildings 7.5 credits

Smarta byggnader

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for AF2513 valid from Autumn 2024

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

The Built Environment

Specific prerequisites

Documented knowledge in Thermodynamics, Building Physics, Building Services Technologies and Systems (amounting in total to 11 ECTS), corresponding to the content in the courses AE1601 and AF1402 and at least 3 ECTS from AF2508.

Eng B/6 according to the Swedish upper secondary school system.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After passing the course, the student should be able to:

· The emergence of smart/digital tools and systems in the built environment is rapidly enhancing our ability to monitor, analyze and control complex aspects of building performance, allowing us to pursue and achieve key sustainability goals in a more wholesome perspective. This includes higher user satisfaction, higher energy and resource efficiency, better environmental compatibility (eg decreased green-house-gas emissions), better compliance with codes and regulations, higher building certification levels, increased market value and other key aspects of building performance apply these smart/digital tools and systems.

· Understand how smart/digital tools and systems can be used to achieve a better interaction between individual buildings and larger building systems such as building clusters, districts and cities (from smart buildings to smart cities); apply these smart/digital tools and systems.

Course contents

The development of smart/digital tools and systems for applications in the built environment offers new possibilities to measure, analyse and control complex aspects of building performance and to pursue sustainable and robust solutions in a more wholesome and long-term perspective Future smart and sustainable buildings should be highly user-adapted, energy- and resource-efficient, as well as environmentally compatible, while complying with building codes, certification criteria and requirements of high profitability and market value.

The course comes treat the following fieldsThe following key areas and topics will be discussed:Methodologies and tools for:

User-adapted, sustainable- and smart buildings – introduction.

· Smart/digital tools for buildings and the built environment.

· Follow up/measurement, analysis and optimisation of Building performance.

· Big data, inter-connectivity, cloud-services, machine learning, AI.

· Ontologies, taxonomies and classification systems.

· User-adaptation and user-building interaction.

· Certified services for performance and quality management in buildings.

· From smart buildings to smart cities.

Examination

- TEN1 - Written exam, 2.5 credits, grading scale: A, B, C, D, E, FX, F

- PRO1 - Project assignment, 5.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.