

Module Description, available in: EN

Smart systems for buildings

General Information**Number of ECTS Credits**

3

Module code

TSM_SmartSys

Valid for academic year

2025-26

Last modification

2024-09-24

Coordinator of the module

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Explanations regarding the language definitions for each location:

- Instruction is given in the language defined below for each location/each time the module is held.
- Documentation is available in the languages defined below. Where documents are in several languages, the percentage distribution is shown (100% = all the documentation).
- The examination is available 100% in the languages shown for each location/each time it is held.

	Lausanne			Lugano	Zurich		
Instruction					X E 100%		
Documentation					X E 100%		
Examination					X E 100%		

Module Category

TSM Technical scientific module

Lessons

2 lecture periods and 1 tutorial period per week

Entry level competences**Prerequisites, previous knowledge**

Basic knowledge of building technologies is desirable, but not mandatory

Brief course description of module objectives and content

This module aims to familiarise students with smart systems that are already, or will soon be, present in buildings. These include building automation and control systems (BACS), smart homes, IoT solutions, energy management and building security systems. Students will learn about the purpose, functionality and applications of these systems. They will also cover the necessary fundamentals such as components and system architecture, communication technologies and protocols.

Aims, content, methods

Learning objectives and competencies to be acquired

Learning objectives. The students should

- Understand the purpose, functionality and applications of smart systems for building
- Learn the necessary fundamentals. E.g. components and system architecture, communication technologies, protocols

Competences acquired. Students will be able to

- Understand, select and design smart systems for buildings

Module content with weighting of different components

1. **Introduction** History of smart buildings, definition and benefits, applications
2. **Fundamentals** Automation of buildings, communication technologies, protocols (wired and wireless)
3. **Applications.** Building automation and control systems BACS, smart home, internet of things IoT, energy management systems EMS, building security
4. **Future trends**
5. **Case study**

Teaching and learning methods

- Three lecture periods per week, mixed with practical sessions and exercises.
- Teaching: Frontal teaching and storytelling. Discussion of practical examples. Guided study using lecture notes and textbooks.
- Exercises: Solving practical problems under the guidance of tutors (coaching).

Literature

Assessment

Additional performance assessment during the semester

The module contains additional performance assessment(s) during the semester. The achieved mark of the additional performance assessment(s) applies to both the regular and the resit exam.

Description of additional performance assessment during the semester

Students will carry out a practical case study during the semester (group work). The results will be presented orally in class and marked. The grade will count as 1/4 of the final module mark.

Basic principle for exams

As a rule, all standard final exams are conducted in written form. For resit exams, lecturers will communicate the exam format (written/oral) together with the exam schedule.

Standard final exam for a module and written resit exam

Kind of exam

Written exam

Duration of exam

120 minutes

Permissible aids

Aids permitted as specified below:

Permissible electronic aids

Personal computer or tablet PC with Internet access

Other permissible aids

Open book: Course documentation (slides, personal notes), any other material

Exception: In case of an electronic Moodle exam, adjustments to the permissible aids may occur. Lecturers will announce the final permissible aids prior to the exam session.

Special case: Resit exam as oral exam

Kind of exam

Oral exam

Duration of exam

30 minutes

Permissible aids

Aids permitted as specified below:

Permissible electronic aids

Personal computer or tablet with Internet access

Other permissible aids

Open book: Course documentation (slides, personal notes), any other material