

**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**

Olivier Steiger (HSLU, olivier.steiger@hslu.ch)

**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		
<b>Instruction</b>					X E 100%		
<b>Documentation</b>					X E 100%		
<b>Examination</b>					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 acquired competencies

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

### Contents of module with emphasis on teaching content

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 the standard final exams for modules and also all resit exams are to be in written form**

### Standard final exam for a module and written resit exam

#### Kind of exam

written

#### 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

**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