

**Module Description, available in: EN**

## *Smart systems for building*

**General Information****Number of ECTS Credits**

3

**Module code**

TSM\_SmartSys

**Valid for academic year**

2022-2023

**Last modification**

2021-01-04

**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		
<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 about building technology

**Brief course description of module objectives and content**

In this module, students shall become acquainted with smart systems that are already or soon to be found in buildings. Those include Building Automation and Control Systems (BACS), Smart Home, IoT-solutions, Energy Management Systems and building security. The students will get to know the purpose, functionality and applications of these systems. In addition, they will perform hands-on experiments with some of them. Also, necessary fundamentals will be addressed including system components, communication technologies and protocols.

## Aims, content, methods

### Learning objectives and acquired competencies

**Learning objectives.** The students shall:

- Become acquainted with smart systems for buildings. Notably Building Automation and Control Systems (BACS), Smart Home, IoT-solutions, Energy Management Systems (EMS) and building security
- Understand the purpose, functionality and applications of these systems
- Acquire the necessary fundamentals. I.e. system components, communication systems and protocols

**Acquired competencies.** The students shall be able to:

- Select and understand smart systems for buildings
- Devise smart systems for a given building

### Contents of module with emphasis on teaching content

1. **Introduction:** History of (smart) buildings, definition and structure of a smart building system, applications overview
2. **Fundamentals.** System components, communication technologies (wired and wireless), protocols
3. **Applications.** Building Automation and Control Systems, Smart Home, Internet of Things, Energy Management Systems, building security
4. **Trends.** Future trends in technologies, applications, processes
5. **Case study**

### Teaching and learning methods

- 3 lecture periods per week, with blended exercise sessions and hands-on exercises (case study)
- Teaching: Frontal teaching and storytelling. Discussion of practical examples. Guided learning using lecture notes and textbooks
- Exercises: Solving practical problems under the guidance of the tutors (*coaching*)

### Literature

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## Assessment

### Certification requirements

Module does not use certification requirements

### 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 with internet access

**Other permissible aids**

Open-book: Course documentation (slides, personal notes)

### 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**

Course documentation (slides, personal notes)